

# Draft Environmental Impact Statement

## Alaska Railroad Corporation Construction and Operation of a Rail Line Extension to Port MacKenzie, Alaska

STB Finance Docket No. 35095

### Volume II Appendices



**Lead Agency:**  
Surface Transportation Board

**Cooperating Agencies:**  
Federal Railroad Administration  
U.S. Army Corps of Engineers  
U.S. Coast Guard

**Information Contacts:**  
**Victoria Rutson**  
Chief, Section of Environmental Analysis  
**David Navecky**  
Environmental Protection Specialist

## **Volume II**

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# **APPENDIX A**

## **AGENCY CONSULTATION**

## A. AGENCY CONSULTATION

This appendix contains a selection of the Section of Environmental Analysis's (SEA's) written correspondence with Federal, state, and local agencies. The first letter, sent to the Bureau of Land Management on February 12, 2008, is representative of 22 others sent to 11 other agencies requesting input to the scoping process and comments on the draft scope. The letter sent to the Alaska Department of Natural Resources, State Historic Preservation Officer on March 23, 2009 is a sample letter that is representative of six others sent to one other agency and one tribal entity regarding the Section 106 Consultation meeting.

Table A-1 lists all of the agencies with which SEA has corresponded. Copies of correspondence between SEA and the agencies on the dates listed in Table A-1 are included.

<b>Table A-1</b>	
<b>Agencies Consulted and Dates of Correspondence</b>	
<b>Agency</b>	<b>Dates of Correspondence</b>
<b>Federal Agencies</b>	
Bureau of Land Management	2/12/08
Commander of Seventeenth Coast Guard District (oan-3)	2/12/08
National Marine Fisheries Service	3/21/08; 1/30/09; 3/4/09, 1/25/09
National Marine Fisheries Service, Protected Resources Division and Habitat Conservation Division	2/12/08
U.S. Army Corps of Engineers	2/12/08
U.S. EPA-Alaska Operations Office	2/12/08
U.S. Fish and Wildlife Service	2/12/08; 4/16/08; 2/4/09; 2/6/09; 3/9/09
<b>State Agencies</b>	
Alaska Department of Environmental Conservation	2/12/08
Alaska Department of Fish and Game	2/12/08
Alaska Department of Natural Resources, Alaska Coastal Management Program	2/12/08; 8/12/09; 2/16/10
Alaska Department of Natural Resources, Division of Mining, Land and Water	2/12/08
Alaska Department of Natural Resources, Division of Parks	2/12/08
Alaska Department of Natural Resources, Office of Habitat Management and Permitting	2/12/08
Alaska Department of Natural Resources, Office of Project Management and Permitting	2/12/08; 3/21/08; 11/9/09; 12/31/09
Alaska Department of Natural Resources, State Historic Preservation Officer	2/12/08; 6/19/08; 7/23/08; 2/5/09; 2/27/09; 3/23/09; 4/13/09; 5/15/09; 6/5/09;
Alaska Department of Transportation & Public Facilities	2/12/08
Alaska Knik Arm Bridge and Toll Authority	2/12/08
<b>Local Agencies</b>	
Matanuska-Susitna Borough, Community Development Department	2/12/08; 11/9/09; 2/1/10
Matanuska-Susitna Borough, Borough Manager	12/16/08
Matanuska-Susitna Borough, Historic Commission	3/23/09
Matanuska-Susitna Borough, Planning and Land Use Department, Planning Division	11/18/08





***SURFACE TRANSPORTATION BOARD***  
***Washington, DC 20423***

*Office of Economics, Environmental Analysis and Administration*

February 12, 2008

Kevin Keeler  
Bureau of Land Management  
6881 Abbott Loop Rd.  
Anchorage, AK 99013

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Dear Mr. Keeler:

The Alaska Railroad Corporation intends to file a petition with the Surface Transportation Board (Board), pursuant to 49 U.S.C. 10502, requesting authority to construct and operate a new rail line from Matanuska-Susitna Borough's Port MacKenzie in south-central Alaska to the existing Alaska Railroad Corporation rail system. The Board is the Federal agency responsible for granting authority for the construction and operation of the proposed new rail line. The Section of Environmental Analysis (SEA) is the office within the Board responsible for preparing the appropriate National Environmental Policy Act (NEPA) documentation for railroad construction and operation cases that come before the Board.

SEA has issued a Notice of Intent to prepare an Environmental Impact Statement (EIS) for the Port MacKenzie Rail Extension, a draft scope of study, and a notice of scoping meetings (see attachment). The purpose of this letter is to request your input to the scoping process. We appreciate your comments on the draft scope by the close of the scoping comment period on **March 21, 2008**.

The proposed Port MacKenzie Rail Extension would involve the construction and operation of a new rail line connecting the Matanuska-Susitna Borough's Port MacKenzie in south-central Alaska to a point on the Alaska Railroad Corporation main line between Wasilla and north of Willow, Alaska (see attached map). The proposed rail line would provide freight services between the Port and Interior Alaska and would support the Port's continuing development as a intermodal and bulk material resources export and import facility. Major elements of the proposed rail extension would include between 30 and 45 miles of new railroad track; a 200-foot-wide right-of-way; crossings of local roads, streams, trails, and utility corridors;

sidings; and ancillary facilities. The anticipated train traffic would be two trains daily on average, with one train per day traveling in each direction.

Mr. David Navecky is SEA Project Manager for the project. ICF International is serving as the independent third-party consultant to SEA to assist with the NEPA review process. Mr. Alan Summerville is ICF's Project Manager for the project.

Please send your comments to:

**David Navecky**  
**Surface Transportation Board**  
**395 E Street, SW**  
**Washington, DC 20423-0001**  
**Attention: STB Finance Docket No. 35095**

If you have any questions or would like to discuss the project please do not hesitate to contact Dave Navecky at (202) 245-0294 or Alan Summerville at (703) 934-3616.

Sincerely,

A handwritten signature in black ink, appearing to read "Victoria Rutson". The signature is fluid and cursive, with the first name "Victoria" and last name "Rutson" clearly distinguishable.

Victoria Rutson  
Chief  
Section of Environmental Analysis

Attachments



**UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration**

National Marine Fisheries Service  
P.O. Box 21668  
Juneau, Alaska 99802-1668

March 21, 2008

David Navecky  
Surface Transportation Board  
395 E Street, SW  
Washington DC 20423-0001  
ATTN: STB Financial Docket No. 35095

Re: Alaska Railroad Port MacKenzie Rail Line Extension. Request for Scoping Comments.

Dear Mr. Navecky:

The National Marine Fisheries Service offers the following comments on the scoping process for potential impacts of the proposed Port MacKenzie Rail Line Extension on fish populations, habitat, and water quality in the Matanuska-Susitna Valley. Our comments below detail our assessment of (1) areas that need to be studied closely in the analysis of potential impacts and (2) current engineering practices that can be employed to avoid negative impacts on essential fish habitat (EFH).

**Project Status**

NMFS has reviewed materials distributed by the Alaska Railroad Corporation, the Matanuska-Susitna Borough, and the Surface Transportation Board's Section of Environmental Analysis (SEA). The documentation submitted by the Alaska Railroad Corporation and the Matanuska-Susitna Borough is preliminary in nature and outlines the proposed design, construction, and operation of a rail extension connecting Port MacKenzie to existing rail lines to the north. Several different combinations of routes and connectors are cited, but essentially three potential rail alignments are under review.

Recently, the SEA informed us that the Alaska Railroad Corporation intends to file a petition with the Surface Transportation Board requesting to construct and operate the new rail line in the Matanuska Susitna Borough. The SEA is responsible for preparing the appropriate National Environmental Policy Act (NEPA) documentation for railroad construction and operation. The SEA has thus filed a Notice of Intent to prepare the draft scope of studies and the subsequent Environmental Impact Statement (EIS) that will be used in NEPA proceedings and permitting review under section 404 of the Clean Water Act.

**Essential Fish Habitat**

Under Section 305(b)(2) of the Magnuson-Stevens Act, federal agencies are required to consult with the Secretary of Commerce on any action that may adversely affect EFH.



ALASKA REGION - [www.fakr.noaa.gov](http://www.fakr.noaa.gov)

EFH has been designated for anadromous salmon and marine species of groundfish and crab under NMFS's jurisdiction. EFH encompasses estuarine, near shore and offshore habitats and substrate to include pelagic, epipelagic, and meso-pelagic waters and the benthos. EFH for salmon fisheries consists of the aquatic habitat, fresh and marine waters, necessary to allow salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to healthy ecosystems.

### **Aquatic Ecosystem Processes**

The Matanuska-Susitna Valley comprises a very diverse and complex series of interconnected aquatic and terrestrial ecosystems. The terrestrial land form and surface and ground waters maintain equilibrium in complex hydro-geomorphic processes. These processes support forest, wetland, riparian zones, and hyporeic functions and interactions that facilitate the filtration and percolation of waters released to streams and rivers. The connectivity of these aquatic and terrestrial ecosystem processes supports the chemical exchange of organic nutrients and detrital material, transport of dissolved oxygen and nitrogen, and regulation of water pH and temperature.

These interactions support microbial, micro and macro fauna and invertebrates consequently supporting larval, juvenile and adult fish populations. The foundation of these complex dynamics is dependent on the connectivity, interaction, and balance of all ecological functions.

### **Study Needs**

Historically, railroad construction and transportation infrastructure has negatively impacted fresh water aquatic ecosystem function and balance, causing habitat and wetland fragmentation and altering surface and ground water regimes. These impacts are well documented to have particularly devastating impacts on anadromous fish populations by eliminating fish passages, limiting accessibility to spawning and rearing habitat, and eventually leading to declines in formerly stable and sustainable salmon populations.

The environmental studies conducted for the EIS's assessment of the impacts of the proposed action need to be adequate in scope, analysis, and detail to support both the NEPA process and the section 404 permitting review. Each study design and execution should define a clear set of objectives that incorporate correlated statistical design, sampling methods, and efforts to achieve the objectives with a predetermined level of precision and accuracy.

Of primary concern to NMFS is the identification and characterization of anadromous fish species and associated habitat in the affected landscape. We are also concerned with the potential impact to all supporting natural ecosystem processes, such as wetland and riparian zones, hydrologic function and in-stream flows, and water quality within the affected tributary reach. Studies conducted to satisfy NEPA and the permitting process should include identification and characterization of each of these processes within the

impact area of the final rail line alignment. Studies conducted to identify and characterize fish species (anadromous and resident) should address seasonal relative abundance at all life stages. The aquatic studies should also identify freshwater invertebrates, vegetation, and associated habitat and substrate composition. Any tributary reach intersected by the rail line should be surveyed both up and down stream of the sited reach. For the purpose of this discussion, a reach is defined as 20 times a channel's average width at the specified site.

The absence of anadromous species in a surveyed stream reach may not represent the true historic range and may be the result of pre-existing fish passage barriers downstream. Therefore, fish passage barriers downstream of the rail line should be identified to ensure that future restoration efforts will not be compromised by new rail line construction.

Each of the potentially affected tributaries should be identified and characterized as primary, secondary, or tertiary tributaries, according to Rosgen stream classification techniques at level I and II. Seasonal hydrology and in-stream flow variability should also be characterized within each defined stream reach of a proposed alignment.

The final rail alignment should be sited to avoid wetlands, streams, and rivers that bear fish populations (especially anadromous fish). Where preliminary surveys have identified potential wetlands, functional assessments and wetland delineations should be conducted to one half mile of either side of the proposed final alignment. In addition, any fresh water tributaries identified as bearing anadromous fish populations should also have functional assessments and wetland delineations conducted to the same distance on either side of the tributary. These surveys should also include riparian characterization and descriptions of cover such as woodland vegetative condition and viability, where wetlands are not present.

### **Avoidance of Negative Impacts**

As part of the EIS, all foreseeable cumulative, direct and indirect impacts need to be presented and discussed. The proposed rail line will necessitate an expansion of the Port MacKenzie facility. Industrial and residential development and expansion will likely follow, as well as connection corridors, associated roads, utilities and secondary development.

With an increased understanding of aquatic ecosystem processes and improvements in engineering technologies used in the development of transportation infrastructure, we suggest that the following design considerations be implemented to avoid disruption of the natural ecosystem functions and associated anadromous fish populations.

Current engineering practices used in the design and construction of stream and river crossings have evolved to avoid negative impacts and maintain natural aquatic biological function and ecosystem connectivity. Elevated bridges, rather than culverts, should be used to span all anadromous tributaries. Bridge design and span must consider the

biological function and hydrology of the entire transected flood plain and account for high-water levels at 50- and 100-year flood events.

Where culverts are the only available option, stream simulation models and methods used in conjunction with open bottom culverts (arched or boxed) allow natural substrate and hyporeic function, thus providing higher levels of interaction between terrestrial and aquatic ecologic process. This design approach supports passage of both juvenile and adult salmonids as well as resident populations of fish and invertebrates. It promotes natural water course, exchange and contribution from woody debris, and naturally occurring detrital and sediment transport and deposition.

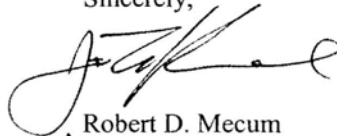
Properly implemented stream simulation methods resist habitat degradation associated with water blockage and restriction, creation of velocity barriers, and scouring during high water events. The use of traditional corrugated pipe culverts should be avoided. These methods irreversibly alter water course, eventually becoming elevated or perched and thus preventing fish passage and degrading natural ecological processes.

Best Management Practices should also be employed on any artificial structure to promote natural hydrology and instream flows. Structures built over naturally occurring waters should conform to the natural stream gradients and alignment of the stream channels, thus reducing scour and eliminating potential velocity barriers.

The Alaska Railroad Corporation has a unique opportunity to set an example by constructing a rail line that considers the sensitive nature, relationship, and connectivity of these ecosystem processes. The incorporation of an ecosystem system approach would support healthy and sustainable salmon populations in the Matanuska-Susitna Valley.

We look forward to working with you to address the issues discussed above to minimize the effects of this project on living marine resources, including EFH. If you have any questions regarding our recommendations for this project, please contact Doug Limpinsel at 907-271-6379 or [Doug.Limpinsel@noaa.gov](mailto:Doug.Limpinsel@noaa.gov).

Sincerely,



Robert D. Mecum  
FR Acting Administrator, Alaska Region

cc:

Dave Navecky (STB) – [naveckyd@stb.dot.gov](mailto:naveckyd@stb.dot.gov)

Mike Nagy (ENTRIX) – [mnagy@entrix.com](mailto:mnagy@entrix.com)

Lynn Noel (ENTRIX) – [lnoel@entrix.com](mailto:lnoel@entrix.com)

Brian Lindamood (ARRC) - [lindamoodb@akrr.com](mailto:lindamoodb@akrr.com)  
Matt LaCroix (EPA) - [LaCroix.Matthew@epa.gov](mailto:LaCroix.Matthew@epa.gov)  
Skip Joy (COE) - [Irvin.T.Joy@poa02.usace.army.mil](mailto:Irvin.T.Joy@poa02.usace.army.mil)  
Serena Sweet (COE) - [serena.e.sweet@usace.army.mil](mailto:serena.e.sweet@usace.army.mil)  
Maureen deZeuw (FWS) - [Maureen\\_deZeeuw@fws.gov](mailto:Maureen_deZeeuw@fws.gov)  
Phil Brna (FWS) - [phil\\_brna@fws.gov](mailto:phil_brna@fws.gov)  
Mark Fink (DFG) - [mark.fink@alaska.gov](mailto:mark.fink@alaska.gov)  
Kim Klein (DFG) - [kim.klein@alaska.gov](mailto:kim.klein@alaska.gov)  
Don Perrin (DNR) - [donald.perrin@alaska.gov](mailto:donald.perrin@alaska.gov)  
Michael L Bethe (DNR) - [mike.bethe@alaska.gov](mailto:mike.bethe@alaska.gov)



**SURFACE TRANSPORTATION BOARD**  
**Washington, DC 20423**

*Office of Economics, Environmental Analysis and Administration*

January 30, 2009

Dr. Kaja Brix  
National Marine Fisheries Service  
709 West 9<sup>th</sup> Street  
P.O. Box 21668  
Juneau, AK 99802-1668

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Dear Dr. Brix:

We are writing you to initiate Section 7 consultations under the Endangered Species Act associated with a proposed rail line project in the Matanuska-Susitna Borough, Alaska.

**Project Description**

The proposed Port MacKenzie Rail Extension would involve the construction and operation of a new rail line connecting the Matanuska-Susitna Borough's Port MacKenzie in south-central Alaska to a point on the Alaska Railroad Corporation's (ARRC) existing main line between Wasilla and north of Willow, Alaska (see enclosed map). ARRC has stated that the proposed rail line would provide freight services between the Port and Interior Alaska. Major elements of the proposed rail extension would include between 30 and 45 miles of new railroad track; a 200-foot-wide right-of-way; crossings of local roads, streams, trails, and utility corridors; sidings; and ancillary facilities. The anticipated train traffic would be two trains daily on average, with one train of 40 to 80 freight cars per day traveling in each direction.

Construction and operation of the proposed rail line would require authorization from the Surface Transportation Board (STB). A decision by the STB would be a "major Federal action" under the National Environmental Policy Act (NEPA) and the STB has assumed the lead agency role in the preparation of an Environmental Impact Statement (EIS) for the proposed project. The STB's Section of Environmental Analysis (SEA) is the office within the agency responsible for preparing the EIS as well as the agency's compliance with other Federal environmental statutes and regulatory programs.



## Section 7 Consultations

SEA has reviewed the project, and after discussions with Mr. Brad Smith of your office on December 18, 2008, determined that the proposed rail line project would not directly affect the endangered Cook Inlet beluga whale (*Delphinapterous leucas*) or any other marine mammal, but could indirectly affect the beluga whale via two mechanisms: (1) potential degradation of forage species habitats (anadromous fish resources), and (2) noise and disturbance from potential increases in vessel traffic, loading and anchorage near Port MacKenzie. SEA plans to evaluate these potential indirect affects with: (1) an Essential Fish Habitat (EFH) Assessment for forage species habitats at anadromous fish crossings throughout the project area, and (2) a Biological Assessment for indirect noise and disturbance effects on the beluga whale in the immediate vicinity of Port MacKenzie at the mouth of Knik Arm. The impact analyses and effects determinations in these two assessments will be used to support the Threatened and Endangered Species section of the EIS. We also plan to use the results of the Biological Assessment to assist with assessing the applicability of Marine Mammal Protection Act requirements.

No direct marine habitat effects would occur as a result of the Port MacKenzie Rail Extension. No critical habitat has yet been designated for the Cook Inlet beluga whale, however indirect effects, if any, would occur within what has been designated as Type 1 habitat (as designated under the National Marine Fisheries Service [NMFS] 2008 conservation plan); which may be designated as critical habitat for this species.

Expansion of facilities at Port MacKenzie by the Matanuska-Susitna Borough is planned independent of the proposed rail extension. Planned expansion of the facilities is considered to have independent utility and is not being evaluated as a connected action under NEPA, but will be evaluated in the cumulative effects analysis by SEA, as appropriate.

Mr. David Navecky is the SEA Project Manager for the project. ICF International is serving as the independent third-party consultant to SEA to assist with the ESA Section 7 consultation and EIS preparation. Mr. Alan Summerville is ICF's Project Manager for the project. Ms. Lynn Noel with ENTRIX Environmental Consultants in Anchorage, Alaska is assisting Mr. Summerville.

Please confirm the species, action area, and identification of indirect project-related effects for SEA's Section 7 Consultation with NMFS and Biological Assessment and respond to:

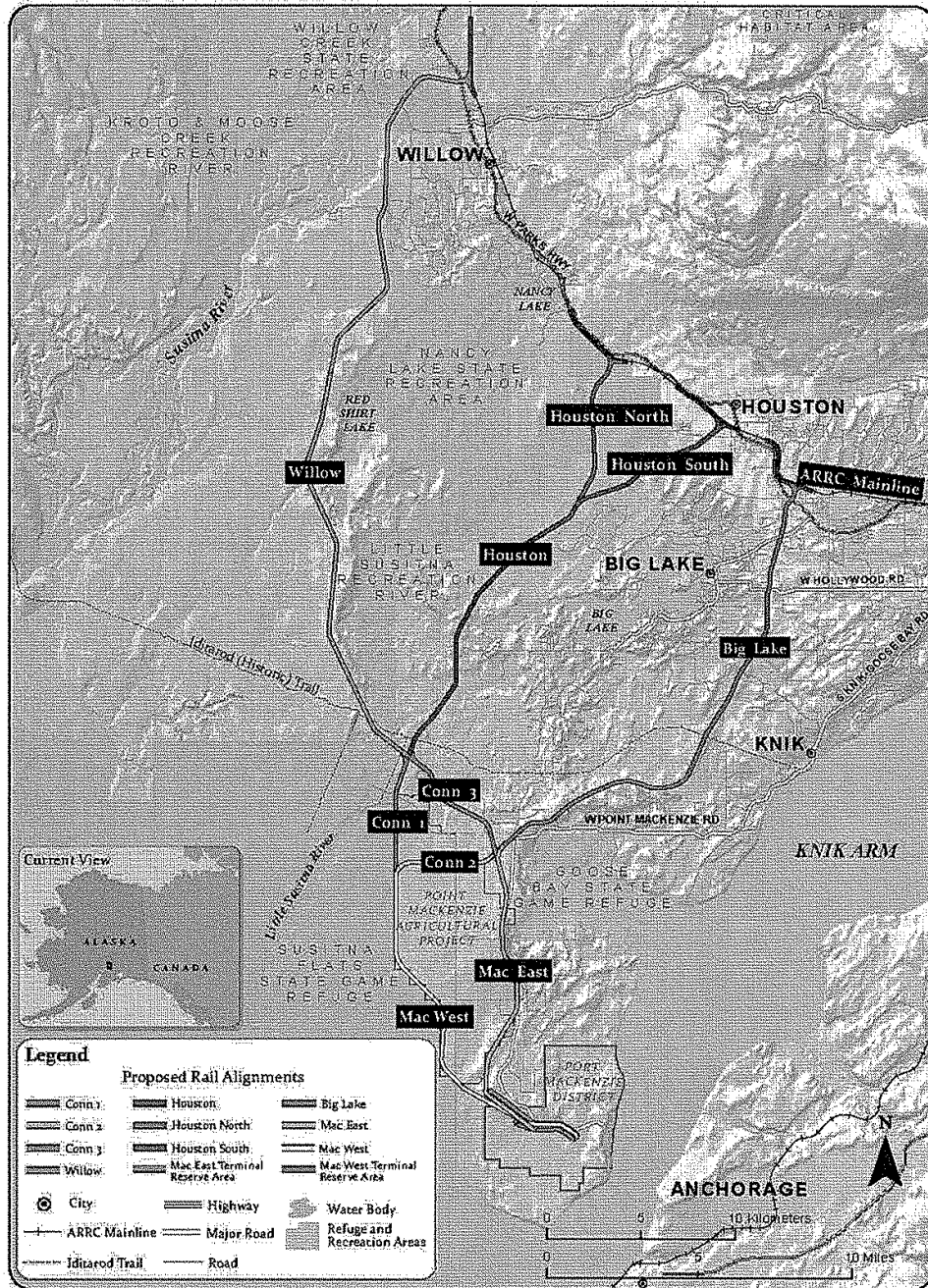
**David Navecky**  
**Surface Transportation Board**  
**395 E Street, SW**  
**Washington, DC 20423-0001**  
**Attention: STB Finance Docket No. 35095**

If you have any questions or would like to discuss the project, please do not hesitate to contact Dave Navecky at 202-245-0294 or Alan Summerville at 703-934-3616.

Sincerely,

A handwritten signature in black ink, appearing to read "Victoria Rutson". The signature is fluid and cursive, with the first name "Victoria" and last name "Rutson" clearly distinguishable.

Victoria Rutson  
Chief  
Section of Environmental Analysis





**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Marine Fisheries Service  
P.O. Box 21668  
Juneau, Alaska 99802-1668

March 4, 2009

David Navecky  
Surface Transportation Board  
395 E Street, SW  
Washington D.C. 20423-0001

Re: Port Mackenzie Rail Extension  
STB Finance Docket No. 35095

Dear Mr. Navecky:

The National Marine Fisheries Service (NMFS) has received your letter requesting information on threatened or endangered species and Essential Fish Habitat (EFH) associated with the proposed the Port Mackenzie Rail Extension. Although the letter also requested NMFS confirms the project-related indirect effects, as per our discussion, we cannot evaluate such information until receipt of your assessment of the effects. NMFS offers the following information under the ESA and the EFH provisions of the Magnuson-Stevens Fishery Conservation Management Act (Magnuson-Stevens Act).

**Threatened and Endangered Species**

Section 7(a)(2) of the ESA directs Federal interagency cooperation "to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species" or result in the destruction or adverse modification of critical habitat. NMFS is responsible for administration of the Endangered Species Act (ESA) for cetaceans, sea turtles, anadromous fish, marine fish, seals, sea lions, marine plants and corals. All other species (including polar bears, walrus and sea otters) are administered by the U. S. Fish and Wildlife Service. Further information on NMFS ESA species can be found at [http://www.nmfs.noaa.gov/pr/species/esa\\_species.htm](http://www.nmfs.noaa.gov/pr/species/esa_species.htm).

Cook Inlet beluga whales are listed as endangered under the ESA and are frequently observed in the waters adjacent to the project and must be considered when evaluating the effects of this project. At this time, critical habitat for Cook Inlet beluga whales has not been designated, however, as stated in your letter, the project is adjacent to Valuable Habitat Type 1, as defined by the 2008 Conservation Plan for the Cook Inlet Beluga Whale. Please be aware that harbor seals have also occasionally been documented in the area. All marine mammals are protected under the Marine Mammal Protection Act.

Several ESA-listed stocks of Pacific salmon occur within Alaskan waters. These include the following Evolutionarily Significant Units (ESU): Snake River fall Chinook, Snake River spring/summer Chinook, Puget Sound Chinook, Upper Columbia River spring Chinook, Lower Columbia River spring Chinook, Upper Columbia River steelhead, Upper Willamette River



ALASKA REGION - [www.fakr.noaa.gov](http://www.fakr.noaa.gov)

steelhead, Middle Columbia River steelhead, Lower Columbia River steelhead, and Snake River basin steelhead. These stocks are mainly found in the North Pacific, south of the Bering Sea. However, the specific occurrence of listed salmonids within the project area is highly unlikely.

**Essential Fish Habitat**

Under Section 305(b)(2) of the Magnuson-Stevens Act, Federal agencies are required to consult with the Secretary of Commerce on any action that may adversely affect Essential Fish Habitat (EFH). EFH has been designated in waters used by anadromous salmon and various life stages of marine fish under NMFS' jurisdiction. Five fishery management plans exist for fisheries in Alaska. They cover groundfish in the Gulf of Alaska, groundfish in the Bering Sea and Aleutian Islands, crab in the Bering Sea and Aleutian Islands, and salmon and scallops statewide. Please visit our web site at <http://www.fakr.noaa.gov/habitat> for additional information on habitat and EFH information.

We hope this information is useful to you in fulfilling any requirements under section 7 of the Endangered Species Act and section 305(b)(2) of the Magnuson-Stevens Act. Please direct any marine mammal questions to Mandy Migura at 907-271-1332, and questions regarding EFH to Doug Limpinsel at 907-271-6379.

Sincerely,



Robert D. Mecum  
Acting Administrator, Alaska Region

cc: Doug Limpinsel



***SURFACE TRANSPORTATION BOARD***  
***Washington, DC 20423***

*Office of Economics, Environmental Analysis and Administration*

November 25, 2009

Regional Administrator  
National Marine Fisheries Service (NMFS)  
709 West 9<sup>th</sup> Street  
P.O. Box 21668  
Juneau, AK 99802-1668  
Attn: Robert D. Mecum

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Dear Mr. Mecum:

The Surface Transportation Board's Section of Environmental Analysis (SEA), as the lead Federal agency for the Port MacKenzie Rail Line Extension Environmental Impact Statement (EIS), is submitting the Port MacKenzie Rail Line Extension Biological Assessment, as required under Section 7 of the Endangered Species Act.

The proposed Port MacKenzie Rail Extension would involve the construction and operation of a new rail line connecting the Matanuska-Susitna Borough's Port MacKenzie in south-central Alaska to a point on the Alaska Railroad Corporation (ARRC) existing main line between Wasilla and north of Willow, Alaska (see attached map). ARRC has stated that the proposed rail line would provide freight services between the Port and Interior Alaska. Major elements of the proposed rail extension would include between 30 and 45 miles of new railroad track within a 200-foot-wide right-of-way; crossings of local roads, streams, trails, and utility corridors; sidings; and associated facilities. The anticipated train traffic would be two trains daily on average, with one train of 40 to 80 freight cars per day traveling in each direction.

SEA has reviewed the project, and after discussions with Mr. Brad Smith on December 18, 2008 and correspondence with NMFS Alaska Region (letter dated March 4, 2009 from Robert Mecum), has determined that the proposed Port MacKenzie Rail Extension **"may affect"** the endangered Cook Inlet beluga whale (*Delphinapterous leucas*) indirectly via two mechanisms: (1) potential degradation of forage species habitats (anadromous fish resources), and (2) noise and disturbance from potential increases in vessel traffic, loading and anchorage near Port MacKenzie. SEA evaluated these potential indirect affects with the enclosed Biological Assessment. The impact analyses and effects determinations in the Biological

Assessment will be used to support the Threatened and Endangered Species section of the Draft EIS that is currently being prepared for this project.

No direct marine habitat effects would occur as a result of the proposed Port MacKenzie Rail Extension. No critical habitat has yet been designated for the Cook Inlet beluga whale, however indirect effects would occur within what has been designated as Type 1 habitat (as designated under the NFMS 2008 conservation plan), which may be designated as critical habitat for this species. The Biological Assessment has concluded that the Port MacKenzie Rail Extension “**may affect, but is not likely to adversely affect**” the beluga whale.

Mr. David Navecky is the SEA Project Manager for the project. ICF International is serving as the independent third-party consultant to SEA to assist with the ESA Section 7 Consultation. Mr. Alan Summerville is ICF’s Project Manager for the project.

We look forward to receiving your concurrence or recommendations on the Biological Assessment. Please respond to:

**David Navecky**  
**Surface Transportation Board**  
**395 E Street, SW**  
**Washington, DC 20423-0001**  
**Attention: STB Finance Docket No. 35095**

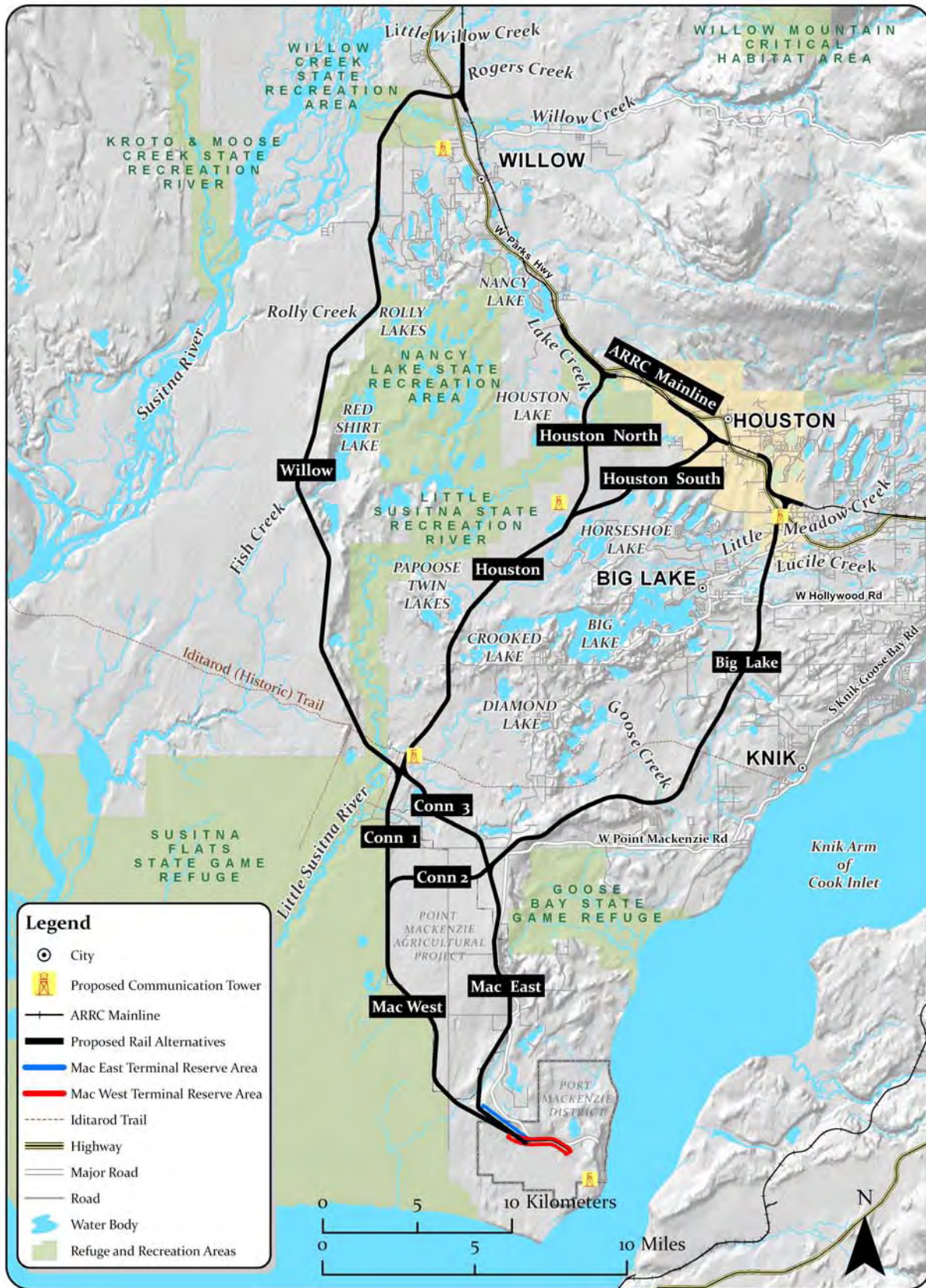
If you have any questions or would like to discuss the project please do not hesitate to contact Dave Navecky at 202-245-0294 or Alan Summerville at 703-934-3616.

Sincerely,

A handwritten signature in black ink, appearing to read "Victoria Rutson". The signature is fluid and cursive, with a large initial 'V' and 'R'.

Victoria Rutson  
Chief  
Section of Environmental Analysis







----- Forwarded by Mike Nagy/Entrix on 04/16/2008 01:45 PM -----

Maureen\_deZeeuw@fws.gov  
04/16/2008 12:14 PM  
To MNagy@entrrix.com  
Subject Port MacKenzie Rail scoping comments

Dear Michael,

We have reviewed the NOI concerning the proposed Port MacKenzie Rail Extension, and are responding to the February 12, 2008, request from the Surface Transportation Board for comments. We did submit scoping comments to the Alaska Railroad Corporation (Brian Lindamood) on October 19, 2007. The plans do not appear to have changed substantially yet, and as you and I have previously discussed on the phone, the comments of the FWS also remain little changed at this time and we ask you to refer to them.

In particular, we continue to express three main areas of concern: 1) habitat fragmentation, 2) cumulative impacts, and 3) compensatory mitigation. The first two items also in turn emphasize the need for comprehensive land use planning, including green infrastructure planning, for this large and relatively undisturbed site. We are particularly concerned that the Scope of Study does not yet address either green infrastructure planning or cumulative impacts. The far west alternative also remains in your plans, and as we have previously expressed, presents significant habitat fragmentation and cumulative impact challenges.

You have asked us for any additional information, and at this time we wish to draw your attention to the Bird Conservation Region 4 habitat map which has just been completed by the interagency/NGO organization Boreal Partners in Flight, via the Alaska Bird Observatory (ABO) in Fairbanks. The map and additional information is available from Susan Sharbaugh at ABO (907-451-7159). Also, we are aware of a habitat restoration project (Mat Su Borough sponsored?) between Anna Lake and Stephen Lake. Chuck Kausic may be your contact for more information on that project. I believe you are aware of the wetlands mapping and functional assessment project headed by the Mat Su Borough that overlaps with some of your project area. The FWS is currently involved on the wetlands mapping and functional assessment team, particularly looking at bird habitat use, but the project is in its beginning stages only. It may prove to be efficient and worthwhile to combine forces to work on bird habitat use in the overlapping area. We expect more developments regarding the bird habitat variable of the functional assessment over the coming weeks and months, and would be happy to discuss this issue further with you. Finally, there is a Breeding Bird Survey route for the Nancy Lakes/Willow area.

We look forward to keeping the lines of communication open as your project planning proceeds, and particularly hope to work together on green infrastructure planning. Also, we would also like to provide general support for the scoping comments provided by the National Marine Fisheries Service on March 21, 2008. Please contact me at the address below or this email address if you have any questions concerning these comments.

Sincerely,

Maureen de Zeeuw  
Fish and Wildlife Biologist  
U.S. Fish & Wildlife Service  
605 West 4th Avenue, Suite 60  
Anchorage, Alaska 99501  
PH: (907) 271-2777  
FAX: (907) 271-2786



**SURFACE TRANSPORTATION BOARD**  
**Washington, DC 20423**

*Office of Economics, Environmental Analysis and Administration*

February 4, 2009

United States Fish and Wildlife Service  
Anchorage Fish and Wildlife Field Office  
Attn: Ann Rappaport  
605 West 4th Avenue, Rm G-61  
Anchorage, AK 99501

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for  
Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie,  
Alaska

Dear Ms. Rappaport:

The proposed Port MacKenzie Rail Extension would involve the construction and operation of a new rail from Port MacKenzie in Matanuska-Susitna Borough to the existing Alaska Railroad Corporation (ARRC) main line between Wasilla and north of Willow, Alaska (see enclosed map). ARRC has stated that the proposed rail line would provide freight services between the Port and Interior Alaska. Major elements of the proposed rail extension would include between 30 and 45 miles of new railroad track; a 200-foot-wide right-of-way; crossings of local roads, streams, trails, and utility corridors; track sidings; and ancillary facilities. The anticipated train traffic would be two trains daily on average, with one train of 40 to 80 freight cars per day traveling in each direction.

The Surface Transportation Board's Section of Environmental Analysis (SEA) is requesting information regarding the presence of threatened and endangered species and designated critical habitat in the project area. A review of the ESA Consultation Guide Map for the Anchorage Fish and Wildlife Field Office indicated that no listed species or designated critical habitats are found in the project area. Please confirm our review of the consultation guide map for SEA's Section 7 consultation with USFWS and respond to:

**David Navecky**  
**Surface Transportation Board**  
**395 E Street, SW**  
**Washington, DC 20423-0001**  
**Attention: STB Finance Docket No. 35095**

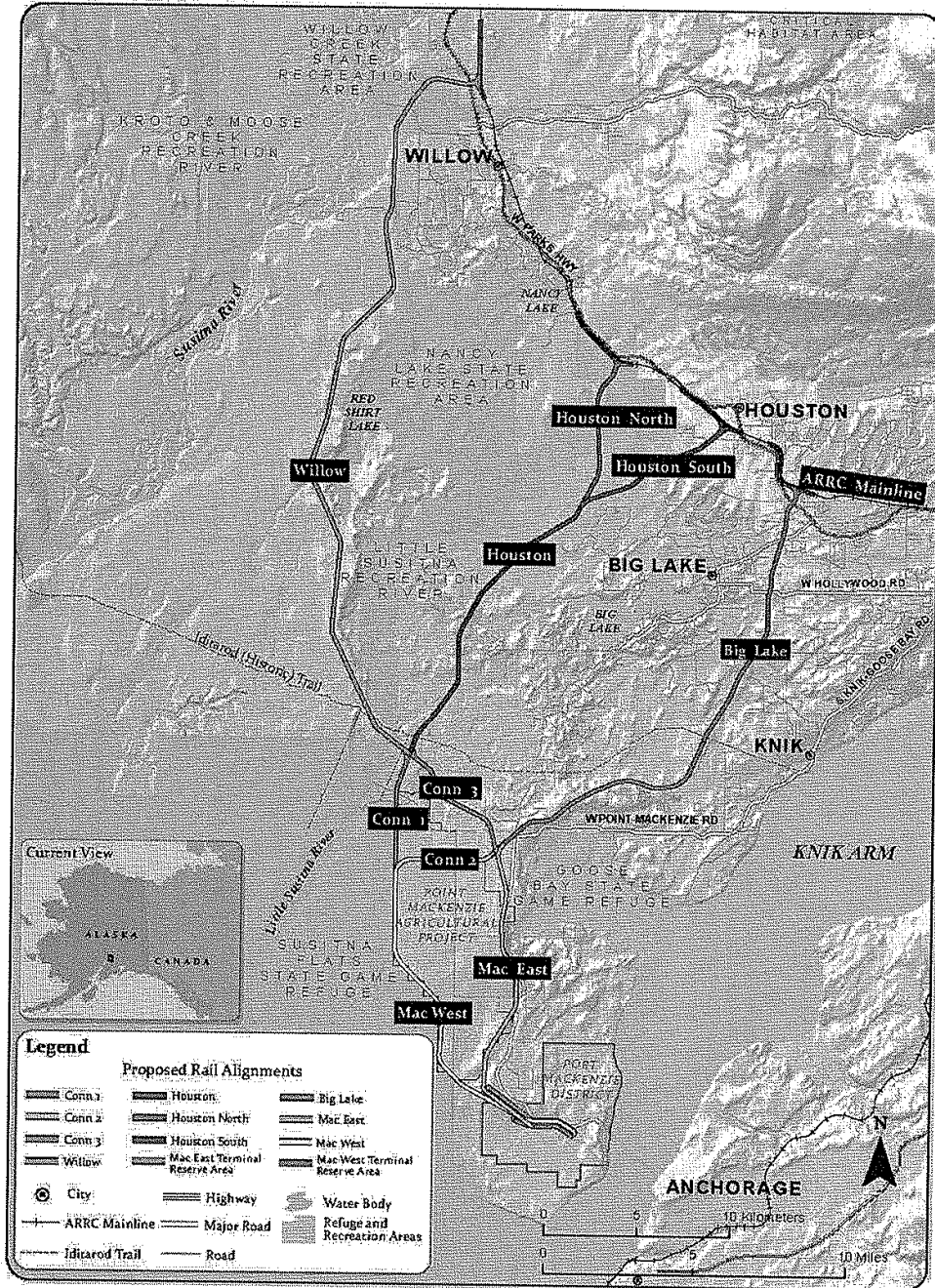
Mr. David Navecky is the SEA Project Manager for the project. ICF International is serving as the independent third-party consultant to SEA to assist with the ESA Section 7 Consultation. Mr. Alan Summerville is ICF's Project Manager for the project.

If you have any questions or would like to discuss the project please do not hesitate to contact Dave Navecky at (202) 245-0294 or Alan Summerville at (703) 934-3616.

Sincerely,

A handwritten signature in black ink, appearing to read "Victoria Rutson". The signature is fluid and cursive, with the first name "Victoria" and last name "Rutson" clearly distinguishable.

Victoria Rutson  
Chief  
Section of Environmental Analysis





**SURFACE TRANSPORTATION BOARD**  
**Washington, DC 20423**

*Office of Economics, Environmental Analysis and Administration*

February 6, 2009

Ms. Ann Rappaport  
U. S. Fish and Wildlife Service  
Anchorage Fish and Wildlife Field Office  
605 West 4th Avenue, Rm G-61  
Anchorage, AK 99501

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for  
Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie,  
Alaska

Dear Ms. Rappaport:

We are writing you to initiate Section 7 consultations under the Endangered Species Act associated with a proposed rail line project in the Matanuska-Susitna Borough, Alaska.

**Project Description**

The proposed Port MacKenzie Rail Extension would involve the construction and operation of a new rail line connecting the Matanuska-Susitna Borough's Port MacKenzie in south-central Alaska to a point on the Alaska Railroad Corporation's (ARRC) existing main line between Wasilla and north of Willow, Alaska (see enclosed map). ARRC has stated that the proposed rail line would provide freight services between the Port and Interior Alaska. Major elements of the proposed rail extension would include between 30 and 45 miles of new railroad track; a 200-foot-wide right-of-way; crossings of local roads, streams, trails, and utility corridors; sidings; and ancillary facilities. The anticipated train traffic would be two trains daily on average, with one train of 40 to 80 freight cars per day traveling in each direction.

Construction and operation of the proposed rail line requires authorization from the Surface Transportation Board (STB). A decision by the STB would be a "major Federal action" under the National Environmental Policy Act (NEPA) and the STB has assumed the lead agency role in the preparation of an Environmental Impact Statement (EIS) for the proposed project. The STB's Section of Environmental Analysis (SEA) is the office within the agency responsible for preparing the EIS as well as the agency's compliance with other Federal environmental statutes and regulatory programs.

## Section 7 Consultations

SEA is requesting information regarding the presence of threatened and endangered species and designated critical habitat in the project area. A review of the Endangered Species Act (ESA) Consultation Guide Map for the Anchorage Fish and Wildlife Field Office indicated that no listed species or designated critical habitats are found in the project area. Please confirm the accuracy of our determination in writing to:

**David Navecky**  
**Surface Transportation Board**  
**395 E Street, SW**  
**Washington, DC 20423-0001**  
**Attention: STB Finance Docket No. 35095**

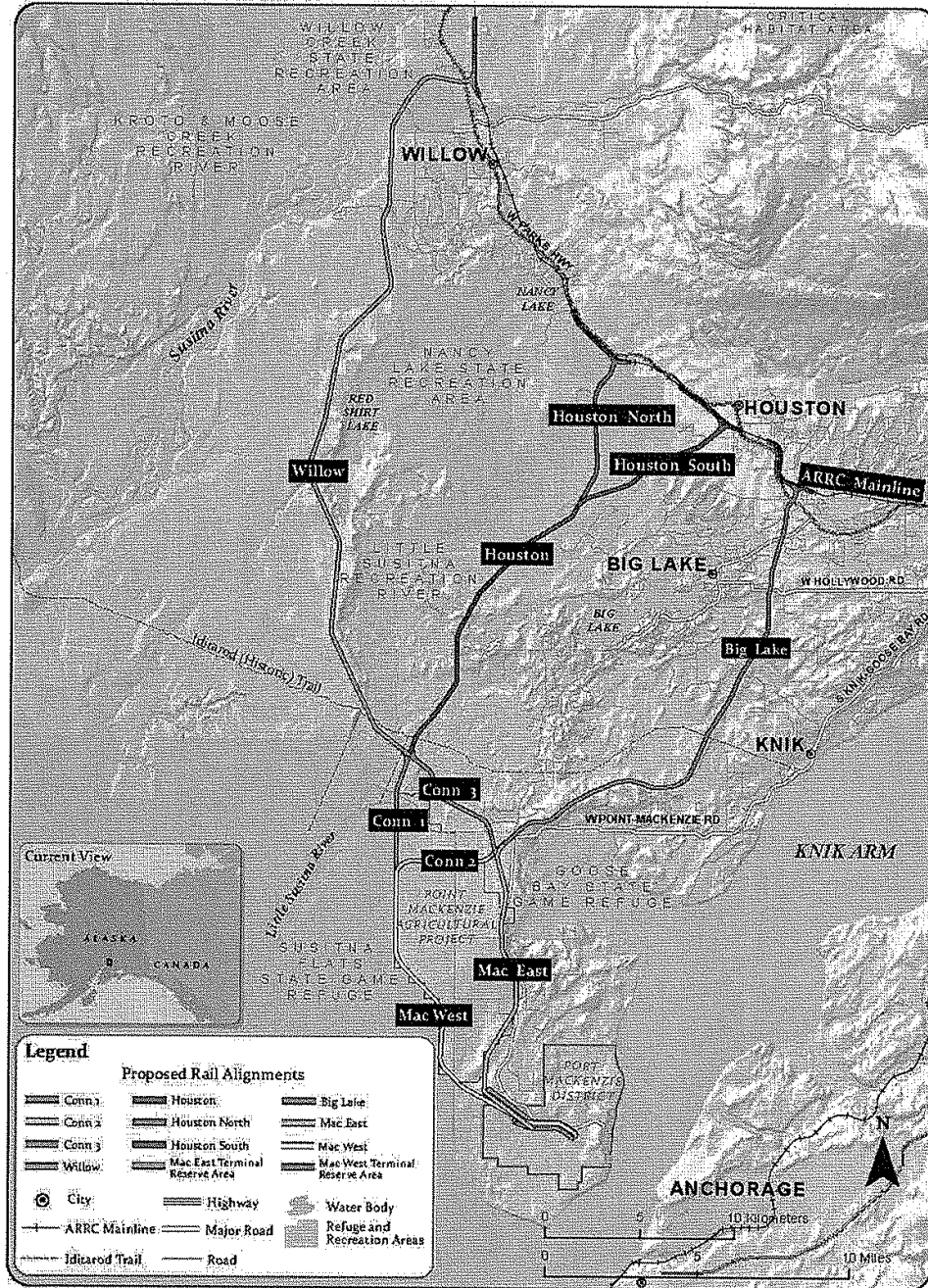
Mr. David Navecky is the SEA Project Manager for the project. ICF International is serving as SEA's independent third-party consultant, assisting with the ESA Section 7 consultation. Mr. Alan Summerville is ICF's Project Manager for the project.

If you have any questions or would like to discuss the project, please do not hesitate to contact Dave Navecky at 202-245-0294 or Alan Summerville at 703-934-3616. Thank you for your assistance.

Sincerely,



Victoria Rutson  
Chief  
Section of Environmental Analysis





## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Anchorage Fish and Wildlife Field Office  
605 West 4<sup>th</sup> Avenue, Room G-61  
Anchorage, Alaska 99501-2249



in reply refer to AFWFO

March 9, 2009

David Navecky  
Surface Transportation Board  
395 E Street, SW  
Washington, DC 20423-0001

Re: Matanuska-Susitna Borough Rail Line Project (*Consultation number 2009-0060*)

Dear Mr. Navecky,

On February 12, 2009, we received a letter from Victoria Rutson, Chief of the Section of Environmental Analysis (SEA). Ms. Rutson identified you as the SEA Project Manager for the proposed Port MacKenzie Rail Extension that would involve the construction and operation of a new rail line connecting the Matanuska-Susitna Borough's Port MacKenzie in south-central Alaska to a point on the Alaska Railroad Corporation's existing main line between Wasilla and north of Willow, Alaska.

Our records indicate that there are no federally listed or proposed species, and/or designated or proposed critical habitat, within the action area of the proposed project. In view of this, requirements of section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq., as amended; ESA) have been satisfied. However, obligations under the ESA must be reconsidered if new information reveals project impacts that may affect listed species or critical habitat in a manner not previously considered, if this action is subsequently modified in a manner which was not considered in this assessment, or if a new species is listed or critical habitat is determined that may be affected by the identified action.

This letter relates only to federally listed or proposed species, and/or designated or proposed critical habitat, under our jurisdiction; namely, the Aleutian shield fern (*Polystichum aleuticum*, listed as endangered in 1988), spectacled eider (*Somateria fischeri*, listed as threatened in 1993), North American breeding Steller's eider (*Polysticta stelleri*, listed as threatened in 1997), the southwest distinct population segment of northern sea otter (*Enhydra lutris kenyoni*, listed as threatened in 2005), short-tailed albatross (*Phoebastria albatrus*, listed as endangered in 2000), polar bear (*Ursus maritimus*, listed as threatened in 2008), and Kittlitz's murrelet (*Brachyramphus brevirostris*, listed as a candidate species in 2005). This letter does not address species under the jurisdiction of the National Marine Fisheries Service, or other legislation or responsibilities under the Fish and Wildlife Coordination Act, Clean Water Act, National Environmental Policy Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, or Bald and Golden Eagle Protection Act.

Thank you for your cooperation in meeting our joint responsibilities under section 7 of the ESA. If you have any questions, please contact me at (907) 271-3063 and refer to consultation number 2009-0060.

Sincerely,

Tim Langer, Ph.D.  
Endangered Species Biologist

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***SURFACE TRANSPORTATION BOARD***  
***Washington, DC 20423***

*Office of Economics, Environmental Analysis and Administration*

August 12, 2009

Margie Goatley  
Project Review Coordinator  
Division of Coastal and Ocean Management  
Alaska Department of Natural Resources  
550 West 7<sup>th</sup> Ave., Ste. 705  
Anchorage, AK 99501

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition to  
Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Dear Ms. Goatley,

The Surface Transportation Board (Board) is the lead agency in the preparation of an Environmental Impact Statement (EIS) for the Alaska Railroad Corporation's (ARRC) proposed rail line extension to Port MacKenzie, Alaska. The U.S. Army Corps of Engineers, U.S. Coast Guard and Federal Railroad Administration are cooperating agencies in the preparation of the EIS. The purpose of this letter is to initiate consultation with the Alaska Department of Natural Resources (ADNR) regarding the project's consistency with the State of Alaska's Coastal Zone Management Plan. The Board's Section of Environmental Analysis (SEA) understands that ADNR could request additional project details during permitting, which is a responsibility of the project proponent – ARRC, to complete this consultation. SEA respectfully requests ADNR provide input on the project's consistency with coastal standards as described below.

**Project Background**

ARRC proposes to construct and operate approximately 30 to 45 miles of new rail line between the Matanuska-Susitna Borough's (MSB) Port MacKenzie in south-central Alaska and a point on ARRC's main line between Wasilla and north of Willow, Alaska. ARRC has stated that the proposed rail line would provide an additional mode of transportation for the movement of bulk materials, intermodal containers, and other freight to and from Port MacKenzie; and would support ARRC's statutory goal to foster and promote long-term economic growth and development in the State of Alaska. ARRC also advances that the proposed rail line would be consistent with Port MacKenzie's economic development plans, which include the continued development of Port MacKenzie as a multi-modal and bulk materials export and import facility.

Figure 1, which is enclosed as an attachment to this letter, illustrates the project area and the build alternatives that have been identified for detailed analysis in the Draft EIS.

### **Coastal Zone Standards and Policies**

In preparing the Draft EIS, SEA has reviewed the statewide standards of the Alaska Coastal Management Program (ACMP), as amended June 2, 2005, as well as the policies of the Matanuska-Susitna Borough (MSB) Coastal Management Plan and the Point MacKenzie Areas Meriting Special Attention (AMSA) Final Plan. Through this review, SEA has identified the elements of the proposed project that are pertinent to the primary areas of concern outlined in the ACMP and MSB's enforceable policies. These elements are described below:

#### **1. Coastal Development** – *Compliance with coastal development standards*

The proposed Port MacKenzie Rail Extension would involve construction of a rail line within the Matanuska-Susitna Borough from Port MacKenzie to an area near Wasilla and Willow, and would require development of coastal areas. Construction of the proposed rail line extension would require the placement of fill material into wetlands and other waters of the U.S., and would cross fish-bearing streams. All reasonable terms and conditions of permit requirements would be incorporated into project design and construction to protect coastal resources during construction and operation of the proposed project.

#### **2. Natural Hazard Areas** - *Development in adherence to safety standards to ensure protection of public safety and the environment from potential damage caused by known natural hazards*

Potential natural hazards exist within the vicinity of the project including earthquakes along the Castle Mountain Fault, tsunami, volcanic eruptions from Mount Spurr, high winds, slope instability in the form of avalanches and land/mudslides, and wildfires. Measures to mitigate potential impacts to the public, rail line and environment from damage caused by natural hazards could include: ensuring the design would meet all relevant codes and safety standards; designing the project in accordance with the latest applicable seismic codes; and taking into account the region's potential for earthquake activity in order to mitigate potential damage to bridges and tracks.

#### **3. Coastal Access** – *Ensure projects maintain and, where appropriate, increase public access to coastal areas*

ARRC has proposed at-grade crossings or grade-separated crossings to maintain vehicular access to coastal waters along existing public and private roads. For those roads where access cannot be maintained through grade crossings, ARRC has proposed relocating roads in order to maintain access. To maintain trail access to coastal waters, ARRC has proposed grade-separating all officially recognized recreation trails crossed by the project.

**4. Energy Facilities – Compliance with siting standards**

Not applicable. No energy facilities are part of the proposed project.

**5. Utility Routes and Facilities – Compliance with siting standards**

Not applicable. The project is located inland and no utilities would be placed along shorelines or beaches.

**6. Timber Harvest and Processing – Compliance with the Forest Resources and Practices Act**

Timber resources would likely be removed during project construction. Timber surveys have not been conducted to quantify the volume of commercial timber in the area that would be cleared, and ARRC has not developed specific plans for timber salvage from land that would be cleared for the proposed rail line right-of-way (ROW). SEA understands that for ROW areas on state or MSB land, applicable land management plans, policies, and regulations require that timber with commercial or personal use values be salvaged from land that is to be cleared for other uses such as mining, transportation or utility corridors, and habitat enhancement projects, where feasible and prudent. SEA understands that similar provisions for timber salvage on other non-state land that would be cleared for the proposed rail line ROW would ensure that timber resources affected by the project were properly utilized.

**7. Sand and Gravel Extraction – Avoidance of sand and gravel extraction from coastal areas when practicable**

Fill material would be required for rail line construction. ARRC plans to obtain subballast and fill primarily from materials excavated during railbed construction, from existing commercial sources, and from borrow areas established along the rail line. As part of the final design and permitting process, ARRC would perform geotechnical testing to identify borrow locations with suitable material. Measures to mitigate potential impacts resulting from fill extraction could include locating suitable borrow areas to avoid and minimize impacts to wetlands and other waters as much as practicable, and ensuring that appropriate Federal, state and local permits are secured prior to construction.

**8. Subsistence - Avoidance and minimization of impacts to subsistence uses of coastal resources**

There are no local, state, or Federally recognized subsistence harvests within the project area; the entire project is within a state nonsubsistence area. According to state regulations (5 Alaska Administrative Code [AAC] 99.015), a nonsubsistence area is “an area or community where dependence upon subsistence is not a principal characteristic of the economy, culture, and way of life of the area of community.” No subsistence hunting or fishing regulations manage the harvest of resources in the project area. Because the

entire project would be in a state nonsubsistence area and there are no Federal public lands in the project area, no harvests of wildlife and fish resources in or directly outside the project area qualify as subsistence activities under either state or Federal regulations.

**9. Transportation Routes and Facilities** – *Minimization of impacts to drainage patterns, wildlife transit and existing access*

The proposed rail line would fill wetlands and cross multiple fish-bearing and non-fish bearing streams with culverts or bridges. The rail line could be designed and constructed in such a way as to maintain natural surface and sub-surface water flow and drainage patterns to the extent practicable to prevent impoundment of water or excessive drainage, bank erosion, and to maintain the connectivity of floodplains, wetlands, streams, and other waters along the rail ROW. All Federal permits for work in jurisdictional waters, such as a Section 404 Clean Water Act permit (33 United States Code [U.S.C]. 1251 *et seq.*), would have to be obtained prior to construction. The Applicant would also obtain and comply with reasonable requirements of all necessary state permits and authorizations, such as the Alaska Department of Fish and Game (ADF&G) Fish Habitat Permit for protection of fisheries.

Construction and operation of proposed rail line would remove and alter vegetation and wildlife habitat, and potentially alter wildlife movements and migration, including moose migration. These potential impacts will be analyzed in the forthcoming Draft EIS.

ARRC has proposed at-grade crossings or grade-separated crossings to maintain vehicular access to coastal waters along existing public and private roads. For those roads where access cannot be maintained through grade crossings, ARRC has proposed relocating roads in order to maintain access. To maintain trail access to coastal waters, ARRC has proposed grade-separating all officially recognized recreation trails crossed by the project.

**10. Habitats** – *Avoidance of adverse impacts to coastal habitats*

The proposed project would require the construction of culverts and bridges to cross wetlands, rivers, streams, floodplains, and riparian habitats along the rail line, which are considered important habitats designated under 11 AAC 114.250(h). Wetlands would also be filled during construction. Measures to mitigate potential impacts to these habitats could include: requiring that the rail line be designed and constructed in such a way as to maintain natural surface and sub-surface water flow and drainage patterns to the extent practicable; employing Best Management Practices (BMPs) during construction and operation of the rail line to minimize impacts to habitats; requiring that ARRC obtain all Federal permits for work in jurisdictional waters, such as a Section 404 Clean Water Act permit, prior to construction; and requiring that ARRC obtain and comply with reasonable requirements of all state permits necessary for the protection of water resources and fisheries, such as the ADF&G Fish Habitat Permit.

**11. Air, Land, and Water Quality** – *Compliance with the statutes and regulations of the Department of Environmental Conservation regarding the protection of air, land, and water quality*

Measures to mitigate potential impacts to air, land, and water quality could include requiring that ARRC comply with all Federal regulations concerning air, land, and water quality where impacts are unavoidable, and all reasonable requirements of applicable ADEC regulations identified in Alaska Statute (AS) 46.40.040(b) during construction and operation of the proposed rail line.

**12. Historic, Prehistoric, and Archeological Resources** – *Compliance with applicable state statutes*

Several archaeological and historic sites have been documented in the vicinity of the proposed project. There are 56 known prehistoric sites and 22 historic cultural resources located within 1 mile of the proposed ROW. In addition, dogsledding associated with the Iditarod National Historic Trail and Iditarod Race is potentially a cultural landscape eligible for inclusion on the National Register of Historic Places (16 U.S.C. 470f). As a result, SEA is currently developing a Programmatic Agreement with the Advisory Council on Historic Preservation, the Alaska State Historic Preservation Officer and the cooperating agencies to comply with Section 106 of the National Historic Preservation Act. An additional measure to mitigate potential impacts to cultural resources could include requiring that ARRC comply with the applicable requirements of AS 41.35.010 – 41.35.240 and 11 AAC 16.010 – 11 AAC 16.900.

**13. Recreation** - *Development to ensure continued access and use of recreational resources*

The proposed project could affect the following recreational resources depending on the alternative route chosen (if any): 1) Iditarod National Historic Trail, 2) Willow Creek State Recreation Area, 3) Little Susitna State Recreation Area, 4) Susitna Flats State Game Refuge, 5) Nancy Lake State Recreation Area, and 6) numerous recorded and unrecorded trails. The project area is well suited for both winter and non-winter outdoor recreation activities. For recreation areas and game refuges protected under Section 4(f) of the U.S. Department of Transportation Act (49 U.S.C. 303), impacts to recreation will be assessed through a Section 4(f) Evaluation that will be in the Draft EIS. As stated in #3 Coastal Access above, ARRC has proposed grade-separated crossings of all officially recognized trails to provide continuity of trails within the project area.

**14. Waterbody Setback Requirements** – *Compliance with 75-foot setback from ordinary high water line for development activities within the designated recreational use area*

SEA understands the entire project area is within the existing MSB coastal zone, the Designated Recreational Use Area (with the exception of the Point MacKenzie AMSA). Therefore, the proposed rail line would require development within 75-feet of the

ordinary high water line within the designated recreation use area. The proposed project would include construction of culverts and bridges to cross wetlands, rivers, streams, floodplains, and riparian habitats along the rail line, and some wetlands within the project area would be filled during construction. Measures to mitigate potential impacts could include requiring that the rail line be designed and constructed in such a way as to maintain the connectivity of floodplains, wetlands, streams, and other waters along the rail ROW and employing BMPs during construction and operations to minimize impacts to recreational areas.

Construction and operation of the proposed Port MacKenzie Rail Extension would require development in the coastal zone and impact resources within the coastal zone. Potential impacts will be evaluated in the forthcoming Draft EIS and measures to avoid, minimize and mitigate impacts will be developed. SEA respectfully requests ADNR provide input on the project's consistency with coastal standards and suggest mitigation measures, as necessary, to ensure that the project is consistent with the State of Alaska's Coastal Zone Management Plan.

Thank you for your cooperation. If you have any questions, please do not hesitate to contact Dave Navecky, SEA's Project Manager, at 202-245-0294, or Alan Summerville, Project Manager for ICF, SEA's third-party independent contractor, at 703-934-3616.

Sincerely,

A handwritten signature in black ink, appearing to read "Victoria Rutson". The signature is fluid and cursive, with the first name "Victoria" and last name "Rutson" clearly distinguishable.

Victoria Rutson  
Chief  
Section of Environmental Analysis

cc: Don Perrin, ADNR, Program Management and Permit Coordinator

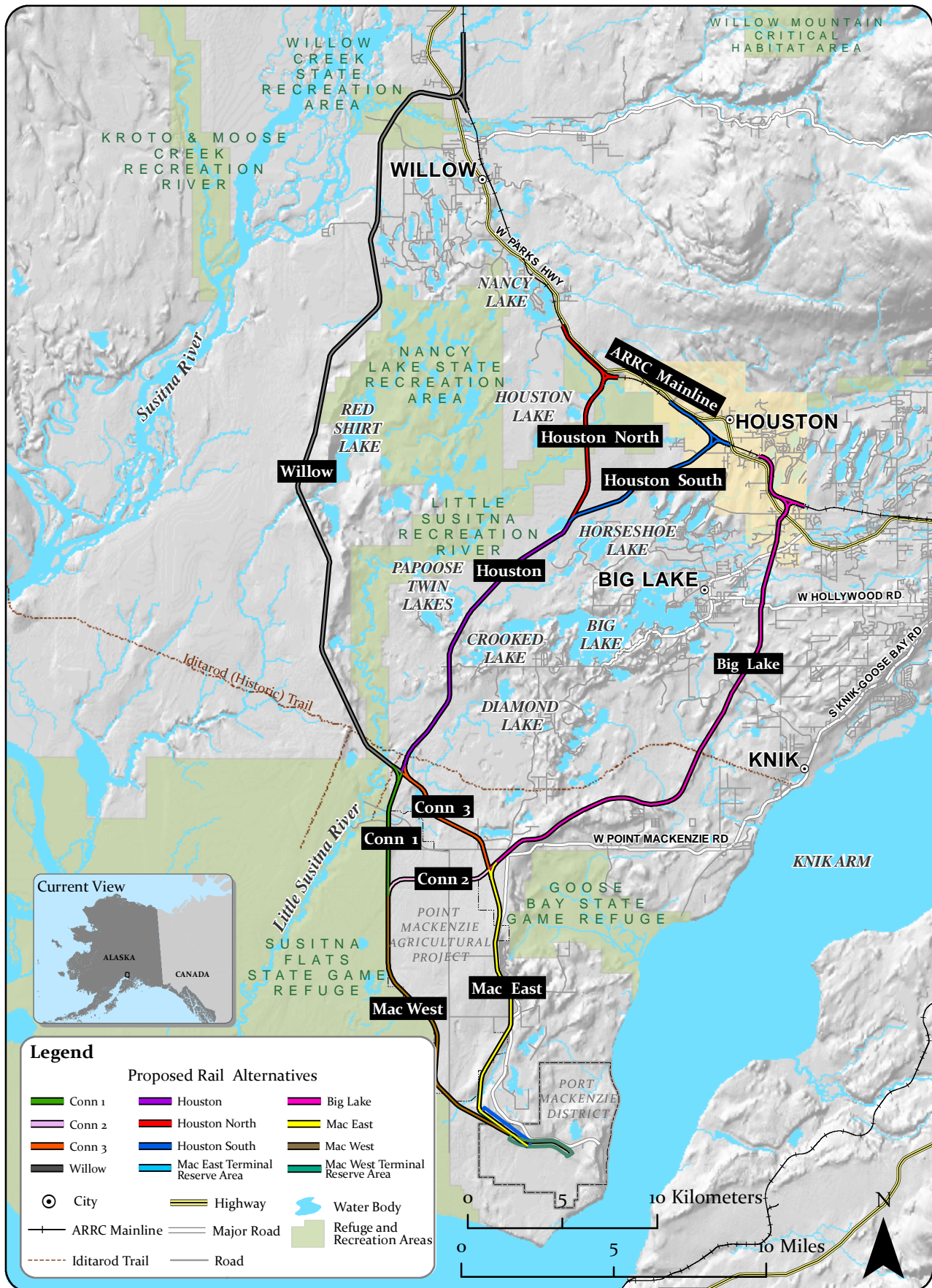


Figure 1



# STATE OF ALASKA

## DEPARTMENT OF NATURAL RESOURCES DIVISION OF COASTAL AND OCEAN MANAGEMENT

<http://www.alaskacoast.state.ak.us>

**SEAN PARNELL**  
GOVERNOR

☒ **SOUTHCENTRAL REGIONAL OFFICE**  
550 W. 7<sup>TH</sup> AVENUE, SUITE 705  
ANCHORAGE, ALASKA 99501  
PH: (907) 269-7470 / FAX: (907) 269-3981

☐ **CENTRAL OFFICE**  
P.O. BOX 111030  
JUNEAU, ALASKA 99811-1030  
PH: (907) 465-3562 / FAX: (907) 465-3075

☐ **PIPELINE COORDINATOR'S OFFICE**  
411 WEST 4<sup>TH</sup> AVENUE, SUITE 2C  
ANCHORAGE, ALASKA 99501-2343  
PH: (907) 257-1351 / FAX: (907) 272-3829

2/16/2010

Surface Transportation Board  
395 E Street, SW  
Washington, DC 20423  
Attn: Victoria Rutson

**SUBJECT:** Alaska Railroad Petition to Construct & Operate a Rail Line Extension to Port MacKenzie, Alaska, STB Finance Docket No. 35095

Dear Ms. Rutson:

The Division of Coastal and Ocean Management (DCOM) has reviewed the letter submitted by your agency on August 12, 2009. Your letter explained that the Surface Transportation Board is the lead agency in the preparation of an Environmental Impact Statement (EIS) for the Alaska Railroad Corporation's (ARRC) proposed rail line extension to Port MacKenzie. Your letter indicated that your agency wishes to initiate consultation with the DCOM regarding the consistency of the proposed project.

The purpose of this letter is to inform you that it is our determination that ACMP review is not required at this stage of the proposed project. While Federal agency activities affecting any coastal use or resource are subject to consistency review per 15 CFR 930 Subpart C, the Surface Transportation Board is not the applicant for the proposed rail extension. The act of serving as the lead agency for an Environmental Impact Statement does not constitute a "federal agency activity" as that term is applied under Subpart C.

Although the Surface Transportation Board is considering issuing a federal license to the ARRC for the proposed rail extension, that license is not on the list of federal permits in regulation subject to ACMP review under Subpart D of 15 CFR 930. This project would ultimately be reviewed for consistency with the ACMP under Subpart D with the ARRC as the applicant and with other federal permits subject to ACMP review.

For purposes of compliance with NEPA, the STB could generally describe the CZMA, ACMP, and relevant coastal district policies, and reflect that the appropriate time for the proposed railroad extension to undergo an ACMP consistency review is when a route has been selected, design is finalized and permit applications are submitted for review.



The ARRC may profit from consulting your SEA and considering the ACMP standards you addressed in your letter when they submit a Coastal Project Questionnaire to being the ACMP process after a route has been selected and design is finalized. DCOM would expect a greater level of detail in the consistency evaluation when ARRC submits an application. Additional notes we can provide on the consistency evaluation in the interests of a more complete future ARRC application appear below:

1. **Coastal Development:** This standard prioritizes developments in or adjacent to (near but not necessarily touching) coastal (salt) waters. Future submittals would contain descriptions about how the railroad extension is either water-dependent, water-related or neither water-dependent or water-related.
2. **Natural Hazard Areas:** The Matanuska Susitna Borough coastal management plan does not currently contain any designated natural hazard areas, but natural hazards can be designated during the course of an individual consistency review.
3. **Subsistence Designated Areas:** The Matanuska Susitna Borough coastal management plan does not currently contain any designated subsistence use areas, but these areas can be designated during the course of an individual consistency review.
4. **Habitats:** Future submittals would break out each individual habitat type the project occurs in and give a detailed description of how the railroad extension is designed to avoid, minimize and lastly mitigate significant adverse impacts to habitat types managed by the ACMP. The ARRC would describe all efforts/design considerations made to avoid adverse impacts, then describe efforts to minimize impacts.
5. **Matanuska Susitna Borough Coastal District Enforceable Policies:** Future submittals will need to address any Matanuska Susitna Borough district enforceable policies that apply.

DCOM applauds your decision to include the ACMP standards in your NEPA analysis and very much appreciates the spirit of coordination. Thank you for your cooperation with the ACMP. Please contact me if you have any questions at 907-269-7480 or [Melinda.ODonnell@alaska.gov](mailto:Melinda.ODonnell@alaska.gov).

Sincerely,



Melinda O'Donnell  
Project Review Supervisor

cc: ARRC



**SURFACE TRANSPORTATION BOARD**  
**Washington, DC 20423**

*Office of Economics, Environmental Analysis and Administration*

November 9, 2009

Donald Perrin  
Alaska Department of Natural Resources  
Office of Project Management and Permitting  
550 W. 7th Ave., Suite 705  
Anchorage, AK 99501

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate of a Rail Line Extension to Port Mackenzie, Alaska; Request for Information Regarding 4(f) Applicability, Measures to Minimize Harm, and *de minimis* Findings

Dear Mr. Perrin:

The purpose of this letter is to request input from official(s) with jurisdiction over the resources identified below regarding (1) the applicability of Section 4(f) of the U.S. Department of Transportation Act of 1966 (also referred to as “Section 4(f)”) to the recreation resources that could be affected by the above-referenced project (also referred to as the “Port MacKenzie Rail Extension”); (2) whether there are any other resources under Alaska Department of Natural Resources (ADNR) or Alaska Department of Fish and Game (ADF&G) jurisdiction that qualify as Section 4(f) resources and would be affected by any of the alternatives for the proposed rail line; and (3) where the proposed project may require the use of a Section 4(f) resource, whether proposed mitigation and measures to minimize harm would support a finding of *de minimis* use.

**Section 4(f) Background**

The Surface Transportation Board’s (the Board) Section of Environmental Analysis (SEA) is in the process of developing a Draft Environmental Impact Statement (EIS) for the proposed Port MacKenzie Rail Extension. SEA anticipates that the Draft EIS will include a determination that some of the alternatives analyzed for the proposed Port MacKenzie Rail Extension could have an effect on one or more recreational resources located within lands managed by ADNR or ADF&G that may be protected under Section 4(f).

Section 4(f) applies to the actions of agencies within the U.S. Department of Transportation (U.S. DOT). In order for the Federal Railroad Administration (FRA), a U.S. DOT agency and a cooperating agency in the development of this EIS, to grant funding for the proposed Port MacKenzie Rail Extension, FRA must determine and evaluate the project’s potential effects to resources protected under Section 4(f). The Secretary of the Department of Transportation cannot approve a transportation project requiring the use of publicly owned parks, recreation areas, or wildlife and waterfowl refuges, or significant public or private historic sites

unless there is no prudent and feasible alternative to using that land and the project includes all possible planning to minimize harm to the Section 4(f) resource.

Resources protected under Section 4(f) include “significant publicly owned public parks and recreational areas that are open to the public and significant publically owned wildlife and waterfowl refuges.” The term “significant” means that in comparing the availability and function of the park, recreational area or wildlife and waterfowl refuge, with the park, recreation or refuge objectives of the community or authority, the resource in question plays an important role in meeting those objectives. Further, one of its major purposes and functions must be for park, recreation, or as a refuge. If any of the resources identified below offer incidental, secondary, occasional or dispersed park, recreational or refuge activities, then this does not constitute a major purpose and the resource would not qualify for protection under Section 4(f).

### **Potential Section 4(f) Properties**

We have identified the following preliminary list of potential Section 4(f) properties that could be affected by one or more of the alternatives for the proposed rail line:

- *Little Susitna State Recreation River.* The recreation area, including the Nancy Lake Creek Public Use Site, offers public recreation opportunities, including boating, camping, fishing, and hiking and all-terrain vehicle use on trails along the banks of the river.
- *Nancy Lake State Recreation Area.* The recreation area provides opportunities for canoeing, picnicking, fishing, hiking, camping, dog sledding, skiing, snowshoeing, and snowmachining.
- *Willow Creek State Recreation Area.* Recreational activities available in the area include fishing, camping, floating/boating, winter trails (including the Lucky Shot Trail), wildlife viewing, and hunting.
- *Mud Lake Trail.* This is a multi-use winter trail located near the northwest corner of the Nancy Lakes State Recreation Area that provides access between Nancy Lakes State Recreation Area and the West Gateway Trail System.
- *Pipeline Trail.* This a multi-use winter trail that follows a gas pipeline corridor and provides access to the Point MacKenzie area, the Susitna River, and the Susitna Flats State Game Refuge.
- *Flathorn Lake Trail.* This is a multi-use winter trail that provides access to the Susitna Flats State Game Reserve and the Little Susitna River.
- *Aurora Dog Mushers Trail.* This system is a series of non-motorized winter trails southeast of Big Lake that provides training and racing opportunities for dog sledders.
- *Susitna Flats State Game Refuge.* The refuge provides important public recreation opportunities, including fishing, hunting, boating, wildlife viewing, and multi-use winter trails.

SEA, on behalf of FRA, respectfully requests that ADNR and ADF&G determine whether the availability and function of these resources plays an important role in meeting agency objectives and verify that one of the major purposes and functions of these resources is for park, recreation, or as a refuge. Additionally, if there are any other potential Section 4(f) resources that would be affected by the proposed rail line that we have not identified, please provide information on these resources and their location in your reply.

### **Measures to Minimize Harm and *de minimis* Findings**

SEA is also developing measures to minimize potential impacts to Section 4(f) resources. SEA will include these mitigation measures in the Port MacKenzie Rail Extension Draft EIS. The measures will include voluntary mitigation developed by the Applicant, as well as preliminary mitigation developed by SEA. Below is a list of measures we are considering including in the Draft EIS to mitigate potential impacts of the proposed rail line on the resources managed by ADNR or ADF&G identified above.

*The Applicant shall consult with land managers to develop a plan to ensure project-related construction activities occur during the most appropriate timeframe, designate temporary recreational access points if main access routes must be obstructed during construction, and consult with the agencies with jurisdiction and user groups to limit potential impacts to recreation activities.*

*Depending on the alternative authorized, the Applicant shall coordinate with the U.S. Coast Guard to provide adequate clearances for navigation of recreational boats on navigable rivers (e.g. Willow Creek and the Little Susitna River).*

*The Applicant shall maintain public access to and from legally authorized trails and Matanuska-Susitna Borough (MSB) recognized trail easements. The Applicant shall provide grade-separated crossings where the new rail line would cross these trails, although some trails could require some realignment to consolidate crossings. The Applicant shall work with trail user groups to design and construct grade-separated trail crossings.*

*The Applicant shall consult with ADNR, ADF&G, and MSB to determine where significant public access is occurring to and along public and navigable water bodies. If existing levels of access or significance of adjacent water bodies merit access preservation, the Applicant shall design project-related waterbody crossing structures to accommodate upland access on public land along waterways.*

*If the Surface Transportation Board authorizes the Mac West segment, the Applicant shall consult with the ADF&G to develop and implement measures, including consideration of replacing refuge acreage used for project-related rail right-of-way, to minimize impacts to the Susitna Flats State Game Refuge to the extent practicable.*

*If the Surface Transportation Board authorizes the Willow segment, the Applicant shall consult with ADF&G and ADNR to develop and implement measures, including consideration of replacing acreage used for project-related rail right-of-way, to minimize potential impacts to the Willow Creek State Recreation Area, Nancy Lakes State Recreation Area and Little Susitna River State Recreation River Area. The Applicant shall identify any additional trails, campsites, or other uses within the recreation areas that could be potentially affected by the project and shall coordinate with ADNR Division of Parks and Recreation (DPOR) to craft a site-specific crossing plan to eliminate or decrease potential impacts to the extent practicable.*

*If the Surface Transportation Board authorizes the Houston North segment, the Applicant shall consult with the ADNR to develop and implement measures to minimize potential impacts to the Little Susitna State Recreation River and the Nancy Lake Creek Junction public use site including replacement of any camping or other facilities within the right-of-way.*

*If the Surface Transportation Board authorizes the Connector 1 segment, the Applicant shall consult with ADF&G and ADNR to determine if any trails in addition to official recognized trails within and surrounding the Little Susitna Public Use Facility have high enough levels of use to merit consideration for a grade-separated crossing.*

*If the Surface Transportation Board authorizes the Willow segment, the Applicant shall provide two grade-separated crossings for the Lucky Shot Trail within the Willow Creek State Recreation Area and shall construct a bridge over Willow Creek with adequate clearance to ensure public access along the waterway during winter as well as summer conditions.*

*If the Surface Transportation Board authorizes the Willow segment, the Applicant shall determine whether access would be made available to the parkland in the Nancy Lakes State Recreation Area west of the proposed right-of-way; if such accommodation is warranted but not practicable, the Applicant shall consult with ADNR DPOR to determine appropriate mitigation for the loss of public access to this area.*

*If the Surface Transportation Board authorizes the Willow or Houston North segments, the Applicant shall construct a bridge over the Little Susitna River with adequate clearance to ensure public access along the waterway during winter as well as summer conditions.*

*If the Surface Transportation Board authorizes the Mac West, Connector 1, and/or Willow segments, the Applicant shall consult with ADFG to identify trails, campsites or other uses within the Susitna Flats State Game Refuge that would be affected and develop a site-specific crossing plan to maintain public access for Susitna Flats State Game Refuge.*

Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (49 U.S.C. 303), also known as SAFETEA-LU, amended Section 4(f) statutory requirements to include an exception for uses of protected land that would have a “*de minimis*” impact on that land. The U.S. Secretary of Transportation may make a finding of *de minimis* impact if the project “will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection” under Section 4(f), and if the “Secretary has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge.” To complete the Section 4(f) evaluation, SEA, on behalf of FRA, is requesting your input on whether a *de minimis* impact finding for any or all of the properties identified above could be reached through the implementation of the measures described above, or with the development and implementation of additional mitigation measures.

In summary, please indicate if you concur that: (1) this letter has identified all the ADNR- and ADF&G-managed Section 4(f) resources potentially affected by the proposed Port MacKenzie Rail Extension; (2) there are no other ADNR- or ADF&G-managed Section 4(f) resources potentially affected by the proposed project; and (3) the potential mitigation measures outlined in this letter would make the potential impacts *de minimis* for any of the Section 4(f) resources listed in this letter, and if so, which resources. If we have failed to identify all the ADNR- or ADF&G-managed Section 4(f) resources, please identify their location and provide a

description of the resource in your reply. If ADNR or ADF&G believes that additional mitigation measures would be required to make the potential impacts on Section 4(f) resources *de minimis*, please outline such measures in your reply. Please address your reply to Dave Navecky of my staff at the letterhead address, or as an email attachment to [David.Navecky@stb.dot.gov](mailto:David.Navecky@stb.dot.gov).

Your hard work and cooperation to date has helped make this environmental review process the “hard look” required by NEPA. I thank you in advance for the expertise and effort needed in responding to the questions posed in this letter. If you have any questions, please do not hesitate to contact Dave Navecky, SEA’s Project Manager, at 202-245-0294, or Alan Summerville of ICF International, Project Manager for SEA’s third-party contracting team, at 703-934-3616. We would appreciate your reply by December 9, 2009.

Sincerely,



Victoria Rutson  
Chief  
Section of Environmental Analysis

**cc:**

Mr. John Winkle  
Federal Railroad Administration  
Office of Railroad Development  
1200 New Jersey Ave SE - Mail Stop 20  
Washington, DC 20590

# STATE OF ALASKA

SARAH PALIN, GOVERNOR

## DEPARTMENT OF NATURAL RESOURCES OFFICE OF PROJECT MANAGEMENT AND PERMITTING

March 21, 2008

Surface Transportation Board  
Case Control Unit  
1925 K Street, NW  
Washington, D.C. 20423-0001  
Attention: David Navecky  
Environmental Filing

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line to Port MacKenzie, Alaska. Notice of Intent to Prepare and Environmental Impact Statement.

The State of Alaska has reviewed the February 12, 2008 Notice of Intent from the U.S. Department of Transportation Surface Transportation Board (STB) to prepare an Environmental Impact Statement (EIS) for the proposed Alaska Railroad Corporation (ARRC) Port MacKenzie Rail Extension. The ARRC seeks authority to construct and operate approximately 30 to 45 miles of new rail connecting the Matanuska-Susitna Borough's Port MacKenzie to a point on the ARRC main line between Wasilla and Willow, Alaska. The following comments represent the consolidated views of the State's resource agencies and supplement the enclosed State of Alaska agency pre-scoping comments previously submitted to ARRC.

The Notice of Intent requests comments on the included Draft Scope of Study for the EIS. In general, the State supports the scope as presented. The project would require authorizations and consultation with State of Alaska agencies, including the Alaska Departments of Natural Resources, Environmental Conservation, Fish and Game, and Transportation & Public Facilities, concerning a wide range issues with regard to fish passage, fragmentation of wildlife habitat, the presence of cultural sites, native allotments, state recreation areas and game refuges, water quality, historic land use patterns, and road/rail crossings. We note that land ownership and the successful acquisition of Rights-of-Way will also significantly affect the final route selection. General comments on the draft scope of study, including route selection and design considerations are provided with the corresponding draft Scope of Study number below:

### 1. Safety

Please include a discussion of hazardous materials, including petroleum products and spill response.

### 2, 3, 11, & 12. Land Use, Recreation, Socioeconomics, and Transportation Systems

The EIS should specifically evaluate impacts to regional winter trails from not solely a recreational perspective. It should also include the economics, land use, transportation and lifestyle impacts of all alternative routes on winter trail use. Trails also provide the following:

LIFESTYLE/SOCIOECONOMICS: Trails are used by professional dog mushers and snowmachiners for training and racing. This is highlighted by the fact that Willow has just

*“Develop, Conserve, and Enhance Natural Resources for Present and Future Alaskans.”*

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become the new permanent Iditarod Trail Race Restart point due to its typically better snow conditions and trail networks that favor large spectator events. The Iditarod Race annually attracts 30,000 to 40,000 spectators who view the race from a regional perspective; many spectators utilize the entire trail network from Big Lake to beyond Willow to engage in this world-famous trail event. The Annual Iron Dog Race begins in Big Lake and also has a very strong economic and social impact to the region.

**SOCIOECONOMICS/TOURISM:** Trails as a focus for developing a strong winter-based tourism program by having a large inter-connected network of trails that supports overnight lodging, food, equipment rentals, and ancillary marketing. The web-like net of trails currently offer a large menu of north-south and east-west options for tour routes that include groomed and signed trails that cater to both novice and experienced trail users. This includes options of a 1-hour ride to multi-day trips. Once a web is bisected, it is no longer.

**TRANSPORTATION:** The east-west network is multi-faceted to allow residents, lodge owners and recreationists to traverse freely to the west side of the Susitna River drainage. Since there are no bridges or roads to this area, changing river ice openings, differences in freeze-up and varying snow conditions require that many options exist to allow free passage to this area of the state

## **2 & 3. Land Use & Recreation**

Impacts to public access to public resources, i.e., hunting and fishing opportunities, trails, access to stream easements and other easements and public lands must be addressed during route selection and rail design. Infrastructure development and Right of Way grants have potential to increase or focus use in areas that are currently not heavily used and well as having the potential to block or alter access across current trails. Customary and traditional access to fish and game resources shall be maintained.

## **4. Biological Resources**

Any of the potential routes for this project traverse a large geographic area and have the potential to negatively impact a wide range of sensitive habitat areas. All work associated with this project that could potentially impact anadromous streams (AS 41.14.870) or could potentially block the free passage of fish (AS 41.14.840) requires a Fish Habitat Permit from the OHMP prior to commencement of any construction.

A multitude of streams supporting both anadromous and resident fish species are present in the project area. Fragmentation of aquatic habitat is a concern. Many of the anadromous streams in the area have been documented in the ADF&G/OHMP Anadromous Waters Catalog (AWC). However, this catalog is a work-in-progress.

There is no such catalog for resident fish species. Comprehensive stream sampling to determine/confirm anadromy and the presence or absence of resident fish will be required. Fish usage patterns may have changed since the area was initially surveyed, and many smaller streams have yet to be sampled. All resultant data should be submitted to ADF&G for inclusion in the AWC.

All flowing waters that may be crossed by the rail extension should be sampled for fish presence to determine the impact of the particular route on fish passage. These streams should be identified by a combination of aerial and foot surveys because many minor streams are not mapped and may not be



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apparent from the air. Electroshocking in conjunction with foot surveys is the preferred sampling method. All possible fish species would be susceptible to capture and post-spawning salmon carcasses would be apparent.

The presence of many of the potential fish species (e.g. Pacific salmon) is seasonal in nature. Sampling should be conducted between early-August and mid-September to ensure all possible species are present in the stream at some stage of their life history. Sampling in even years is preferable due to the even-year dominance of pink salmon in this region. Hydrological studies will be required to map wetland areas associated with fish bearing drainage systems. This project has the potential to isolate the free flow of water through these wetland areas, thus impacting fishbearing waters. Wetland continuity should be maintained.

#### Routing and Design Considerations

The use of bridges to span floodplain areas is the preferred method of providing for the long-term free passage of fish on anadromous systems. Bridge abutments should be located outside the floodplain and above the ordinary high water mark (OHW) to minimize potential impacts to riparian vegetation and streambank integrity.

Culverts should be designed using stream simulation methodology. The culvert design width at the OHW mark should be greater than or equal to 125-percent of the width of the stream at the OHW stage. The culvert grade should approximate the surrounding slope of the stream channel ( $\pm 1\%$ ). Culverts should be buried to approximately 40-percent of their diameter with substrate material that will remain dynamically stable at all expected flood discharge rates. Other design criteria will apply as well.

It shall be the responsibility of the ARRC to ensure the free passage of fish throughout the lifetime of each stream crossing. Beavers are common along the various alternative routes. Culvert designs should account for long-term maintenance for fish passage and be of sufficient size (diameter) to discourage blockages associated with beaver dam construction.

#### Route Preferences

The State prefers a route that would minimize potential impacts to wetland areas associated with fish bearing waterways, minimizes the total number of actual stream crossings and avoids crossings of important salmon producing systems such as the Little Susitna River, Willow Creek, and streams in the Nancy Lake and Big Lake watersheds whenever possible. Of the provided routes, these criteria appear to be met best with the following route:

1. Houston South
2. Houston
3. Connector 3
4. Mac East

This conclusion is based on initial examination of existing data and aerial imagery and should be viewed as preliminary. Based on this initial analysis of existing materials, the Willow route would result in more fragmentation of fish and wildlife habitat, particularly in undeveloped areas, than the other alternatives. Crossings over Willow Creek and the Little Susitna River would be necessary.

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Because of the extended length of this route, the potential impacts to wetland areas associated with these drainages could be significant.

## **Wildlife**

All of the proposed routes will cross areas frequently used by moose, potentially reducing travel between habitat patches, and increasing moose-railcar collisions. A baseline field study should be conducted to identify important seasonal moose concentration areas, movement corridors and habitat resources. ADF&G, Wildlife Conservation Division, generally does not permit private entities to capture and handle large mammal species. In response to increasing conflicts between development and moose in the Matanuska Susitna region, the area management biologist has previously proposed a study to GPS collar and track moose in the area to identify migration corridors, migration timing and habitat use. This information, in addition to the study results provided by the Northern Rail extension moose mitigation study, will be important considerations in planning and mitigating to rail extension and operation impacts to moose populations in the area.

Route selection, effective wildlife crossings, and conventional road crossings should be optimized to reduce habitat fragmentation and to reduce wildlife-railcar collisions. Wildlife overpasses, elevated sections of track, and extended lengths of bridges across rivers should all be considered where appropriate.

## **5. Water Resources**

The EIS should include discussion on maintenance of surface water connectivity in streams and wetlands areas, including a description and estimate of the impact of the railroad embankment bisecting wetlands on local water movement to creeks.

Please include the following as a mitigation measure to avoid or minimize potential Project impacts to water quality: “In addition to developing an NPDES Construction General Permit Storm Water Pollution Plan for the Project, DEC adds the requirement that construction contractor and sub-contractor staff shall receive at least 16 hours of erosion and sediment control training.”

Of primary concern is the filling and fragmenting of "high value" wetlands in the lowlands wetland complex ecosystem throughout the project area. The ARRC will need to demonstrate how it will maintain the high degree of water quality in these wetlands, rivers and creeks during construction and maintenance of the proposed rail line.

The EIS should also include discussion of the potential impact of various alternatives on water quality within state parks or wildlife refuges. Specifically, reflecting the requirements of 18 AAC 70.015(a)(3) that states, “if a high quality water constitutes an outstanding national resource, such as a water of a national or state park or wildlife refuge or a water of exceptional recreational or ecological significance, the quality of that water must be maintained and protected;”

Finally, the EIS should include discussion of gravel sources needed for the construction of the railroad embankment and the potential impacts on the water environment resulting from new gravel sites.

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Thank you for the opportunity to comment on the draft Scope of Study for this project. We look forward to working with the STB as it develops the EIS for this project and are available to discuss and clarify the state's scoping and pre-scoping comments.

Sincerely,

/s/

Don Perrin

Project Management and Permit Coordinator

Enclosure: Pre-Scoping State agency comments to the ARRC

Cc: Wayne Biessel, ADNR/DP&OR  
Mike Bethe, ADNR/OHMP  
Ken Bouwens, ADNR/OHMP  
Nina Brudie, ADNR/DCOM  
Stefanie Ludwig, ADNR/OHA  
Sam Means, ADNR/MLW  
Clark Cox, ADNR/MLW  
Tammy Massie, ADF&G/SF  
Tony Kavalok, ADF&G/WC  
William Ashton, ADEC  
Jennifer Witt, ADOT&PF  
Brian Lindamood, ARRC

# STATE OF ALASKA

## DEPARTMENT OF NATURAL RESOURCES

### DIVISION OF PARKS AND OUTDOOR RECREATION

#### OFFICE OF HISTORY AND ARCHAEOLOGY

SARAH PALIN, GOVERNOR

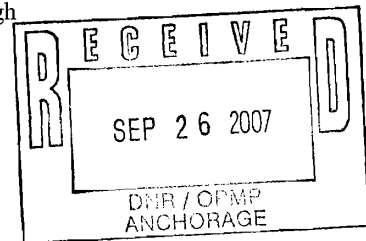
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PHONE: (907) 269-8721  
FAX: (907) 269-8908

September 26, 2007

File No.: 3130-2R ARRC

SUBJECT: Port Mackenzie Rail Extension, Matanuska-Susitna Borough

Brian Lindamood  
Alaska Railroad Corporation  
P. O. Box 107500  
327 Ship Creek Avenue  
Anchorage, AK 99501



Dear Mr. Lindamood,

The Alaska State Historic Preservation Office has reviewed the information on the Port Mackenzie Rail Extension Project that you presented during the agency scoping meeting on September 18, 2007. We have the following comments:

1. As mentioned in your presentation, the project area contains numerous cultural resources. Only a fraction of the project area has been archaeologically surveyed however and it is likely that there are many additional, currently unreported prehistoric and historic sites. Regardless of which alternative is selected, we will likely be recommending additional archaeological survey.
2. All of the alternatives intersect the Iditarod National Historic Trail. The trail was designated by Congress in 1978 for its significance as a historic transportation route. Effects to the trail resulting from the rail extension will need to be addressed.
3. The Matanuska Farm Station was established in 1915 in what is now the Port Mackenzie Agricultural Area. This agricultural landscape will need to be evaluated for eligibility for the National Register of Historic Places.
4. In defining the area of potential effect and identifying historic properties, be sure consider both potential direct and indirect effects to historic properties. Indirect effects may include increased development or changes in setting as a result of the project.

We look forward to continued consultation with you regarding this project. Please contact Stefanie Ludwig at 269-8720 if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner  
State Historic Preservation Officer

JEB:sl

Cc: Don Perrin, DNR/OPMP

# STATE OF ALASKA

**SARAH PALIN**  
**GOVERNOR**

**DEPARTMENT OF NATURAL RESOURCES**  
**OFFICE OF PROJECT MANAGEMENT AND PERMITTING**  
**ALASKA COASTAL MANAGEMENT PROGRAM**

■ **SOUTHCENTRAL REGIONAL OFFICE**  
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[www.alaskacoast.state.ak.us](http://www.alaskacoast.state.ak.us)

October 15, 2007

Brian Lindamood  
Alaska Railroad Corporation  
P.O. Box 107500  
Anchorage, AK 99510-7500

Subject: Port MacKenzie Rail Extension Pre-Application Comments

Dear Mr. Lindamood:

The Office of Project Management & Permitting (OPMP) has reviewed the preliminary information you provided regarding the proposed Port MacKenzie Rail Extension project, and offers the following comments related to the Alaska Coastal Management Program (ACMP).

1. **Proposed Project is Within Coastal Zone.** All of the alternatives for the proposed project are located within the Coastal Zone of Alaska and would require state and federal authorizations triggering a review of the proposed project for consistency with the ACMP.
2. **Timing of ACMP Review.** The ACMP consistency review is initiated when the OPMP receives a complete consistency certification in accordance with 11 AAC 110.410 and 15 CRF 930.58.
3. **Consistency Evaluation.** A complete consistency certification requires an evaluation that includes a set of findings relating the coastal effects of the proposed project and its associated facilities to the relevant enforceable policies of the ACMP. Applicants shall demonstrate that the activity will be consistent with the state standards at 11 AAC 112 and with applicable Mat-Su Coastal Resource District and Point Mackenzie AMSA enforceable policies. The consistency evaluation may be presented during the NEPA process, but the State would not conduct its ACMP consistency review until a route has been selected and the ARRC submits a complete consistency certification.

Port MacKenzie Rail Extension  
OPMP Pre-Application Comments

Page 2

October 15, 2007

4. **Special Areas to Consider.** The ACMP requires that projects in the Coastal Zone be sited, designed and constructed in a way that minimizes impacts to coastal uses and resources. In evaluating the project's potential impacts, special considerations should be made for public access to, from and along coastal waters, traditional access routes, competing uses such as commercial, recreational or subsistence uses, wildlife transit and special management areas such game refuges, as well as other coastal uses and resources outlined in the state standards and enforceable policies of the ACMP.

This concludes OPMP's pre-application comments on the proposed Port MacKenzie Rail Extension project. The OPMP is available to guide and assist the ARRC in submitting the ACMP consistency certification for the proposed project. Please contact me at (907)334-2563 or email [nina.brudie@alaska.gov](mailto:nina.brudie@alaska.gov) if you have any questions.

Sincerely,



Nina Brudie  
Project Review Coordinator

cc: Don Perrin, DNR/OPMP Anchorage

# STATE OF ALASKA

## DEPARTMENT OF FISH AND GAME

*Division of Sport Fish*

**SARAH PALIN, GOVERNOR**

333 Raspberry Road  
Anchorage, AK 99518-1599  
PHONE: (907) 267-2342  
FAX: (907) 267-2464

October 31, 2007

Brian Lindamood  
Alaska Railroad Corporation  
P.O. Box 107500  
Anchorage, AK 99510-7500

Re: Port MacKenzie Rail Extension Pre-Application Comments

The Alaska Department of Fish and Game (ADF&G) has reviewed the preliminary information regarding the proposed Port MacKenzie Rail Extension project pursuant to the Alaska Coastal Management Program (ACMP) (AS 46.40), Special Areas Permitting (5 AAC 95), and the Fish and Wildlife Coordination Act (16 U.S.C. 662).

The Alaska Railroad Corporation (ARRC) and the Matanuska-Susitna Borough (MSB) have jointly proposed to design and construct a 30- to 45-mile rail line from Port Mackenzie to the existing rail system at a point between Meadow Lakes and north of Willow. The anticipated timeline is as follows: 2007-2009, completion of the requirements of the National Environmental Protection Act (NEPA); 2008-2009, final project design; 2009-2011, construction; and 2011-2012, operation. Three major routes have been proposed, but none has thus far been selected. The proposed routes are identified in Attachment 1: Project Area Alternatives. Factors influencing the final route selection include presence of water bodies and anadromous fish streams, wildlife habitat, cultural sites, native allotments, parks and refuges, wetlands, soils, land use and ownership, and feasibility of acquisition of Rights of Way (ROW) by ARRC.

After review of the project alternatives, ADF&G has identified several important considerations. Per 11 AAC 112.300, the selected route should avoid adverse impacts to coastal resources including wetlands, rivers, streams, lakes, and State Game Refuges. Additionally, facilities and improvements associated with ARRC should avoid impacts to offshore areas, estuaries, and tideflats where such impacts could negatively affect water flow and natural drainage patterns or competing uses such as commercial, recreational, or subsistence uses. Where adverse impacts cannot be avoided, measures must be taken to minimize and mitigate all adverse impacts. The ADF&G is mandated to, "manage, protect, maintain, improve, and extend the fish, game, and aquatic plant resources of the state..." In order to avoid impacts and promote healthy fish and wildlife populations, ADF&G offers the following comments for consideration during project development:

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*"... shall manage, protect, maintain, improve, and extend the fish, game and aquatic plant resources of the state in the interest of the economy and general well-being of the state"*



- The selected route should avoid crossing into or through Susitna Flats and Goose Bay State Game Refuges.
- The selected route should minimize the number of stream and wetland crossings.
- Avoid crossing large streams such as Willow Creek, the Little Susitna River, and Fish Creek whenever possible.
- Impacts to rivers and streams should be minimized through use of railway bridges rather than culverts, particularly for streams containing anadromous fishes.
- Bridges should span 100-year floodplains in order to maintain natural water flow and drainage patterns of streams, rivers, and wetlands. All abutments and other infrastructure should be built outside of the floodplain whenever possible. Bridges spanning floodplains will help to maintain riparian vegetation, streambank integrity, and wildlife corridors.
- Public access should be maintained to, from, and along coastal waters, traditional access routes, National Historic Trails, and existing easements (including those along section lines).
- To reduce the likelihood of invasive weed expansion, all soil disturbance due to construction in areas of previously-undisturbed vegetation adjacent to or associated with the rail line should be revegetated with native species within one growing season of the disturbance activity, except where doing so would increase risk of wildfire.
- The construction of a rail line in previously undisturbed areas will result in increased habitat fragmentation. Habitat connectivity should be maintained to the greatest extent possible. The Mac West route and the Willow connection have the greatest potential for fragmenting previously undisturbed habitat. The Mac East route and Big Lake connection is the shortest route, crosses the fewest waterways, and will result in the least fragmentation of previously-undisturbed habitat.
- All three proposed routes will cross areas frequently used by moose, potentially reducing travel between habitat patches, and increasing moose-railcar collisions. A baseline field study should be conducted to identify important seasonal moose concentration areas, movement corridors and habitat resources. Once identified, the impacts of the railroad on these areas must be avoided and minimized. Effective wildlife crossings and conventional road crossings should be optimized to facilitate wildlife movement across the track and to reduce wildlife-railcar collisions. Moose overpasses, elevated sections of track, and extended lengths of bridges across rivers should all be considered and constructed where appropriate.
- Important moose habitat, movement corridors, and effective buffer zones around corridors should be integrated along with green infrastructure, rivers and floodplains, wetlands, recreation areas, and other natural resources into a region-wide land-use plan in order to identify, prioritize, and limit human activities that negatively impact the ecological functionality of the landscape. ARRC should participate in regional planning efforts in coordination with borough planners, federal and state agency representatives, special interest groups, and the public. Regional land use planning should be addressed during assessment of the railway's cumulative impacts.

An analysis of impacts to fish, wildlife, habitat, and aquatic resources must be conducted and should include a detailed assessment of cumulative effects of rail construction as well as associated developments. The associated developments should include roads, utilities, material sources, secondary development, and industry that can be expected to develop as a



Brian Lindamood

-3-

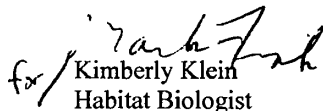
October 31, 2007

result of creation of the rail line. Where current accurate baseline data is lacking, studies to identify the existing resources and potential impacts are needed. In particular, wetlands need to be accurately mapped, hydrology, including flood data, in-stream flow data, and water quality information is needed for potentially affected streams and water bodies.

- Negative impacts to fish, wildlife, habitat, and aquatic resources should be avoided. Where impacts to public trust resources cannot be avoided, they should be minimized and mitigated. A comprehensive approach to identifying effective methods to minimize and mitigate for unavoidable impacts is needed. Mitigation plan development should be conducted in coordination with borough planners, federal and state agency representatives, special interest groups, and the public.
- Potential impacts of a spill of oil, gas, or other hazardous material should be identified along each alternate route. A plan for minimizing the possibility of spills as well as contingency plan to address spills is needed for the selected alternative.

This concludes our pre-application comments on the Port MacKenzie Rail Extension project. These comments represent our review at the pre-application stage; more specific information and recommendations will be forthcoming. We look forward to working with you and other project collaborators on this project. If you or your staff has any questions about the department's comments, or need additional information, please give me a call at 267-2812.

Thank you for the opportunity to comment on this project.

  
Kimberly Klein  
Habitat Biologist

cc via email.

Dave Rutz, ADF&G  
Tony Kavalok, ADF&G  
John Hechtel, ADF&G  
Jim Fall, ADF&G  
Tom Rothe, ADF&G  
Jeff Fox, ADF&G  
Cecil Rich, ADF&G  
Tom Brookover, ADF&G  
Tom Cappiello, ADF&G  
Jason Mouw, ADF&G  
Mike Bethe, DNR  
Phil Brna, FWS  
Doug Limpinsel, NOAA  
Matthew LaCroix, EPA

# STATE OF ALASKA

## DEPARTMENT OF NATURAL RESOURCES

### DIVISION OF PARKS AND OUTDOOR RECREATION

SARAH PALIN, GOVERNOR

MAT-SU / COPPER BASIN AREA  
HC 32 Box 6706  
Wasilla, Alaska 99654  
phone: 907/ 745-3975  
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webpage: <http://www.alaskastateparks.org>

November 14, 2007

Brian Lindamood  
Alaska Railroad Corporation  
PO Box 10700  
Anchorage, AK 99510-7500

Re: Port MacKenzie Railroad Corridor Alternative Comments

Dear Mr. Lindamood,

I have reviewed the Port MacKenzie Railroad Corridor proposal and the various alternatives that are being considered. The Alaska Division of Parks and Outdoor Recreation is responsible for more than just managing the Alaska State Park system, as we are also charged with promoting and enhancing outdoor recreation outside state parks. One example of this is through our promotion of trails for motorized and non-motorized users with funding grants or expertise in designing or managing trails, or by establishing easements. As such, we offer the following comments regarding the proposed rail extension from both a State Park as well as a general outdoor recreation perspective.

**We recommend that the Houston South – Houston – Connector 3 – Mac East alternative be chosen as the preferred alternative.**

This route minimizes impacts to the major recreational/public use areas, eliminates additional bridges over the Little Susitna River and Willow Creek, and focuses the rail line adjacent to existing road corridors.

Although we understand that the Willow Corridor is favored as a route from a design perspective, and because it may have better soils and fewer crossings of private lands, we object to this alternative as this area provides outstanding outdoor recreational opportunities that would be significantly impacted with a railroad bisecting the area. The limited private property is what makes this area so valuable in terms of recreation -- and one of the reasons that many residents live along this corridor.

**From an outdoor recreation perspective, a rail line through the Willow Corridor is the least favorable option presented.**

The following provides additional detail to illustrate our significant concerns with the Willow Corridor:

**1 Willow Creek State Recreation Area would be significantly impacted.** (DNR: Division of Parks and Outdoor Recreation)

The park encompasses almost all of Willow Creek from the Parks Highway to its confluence with the Susitna River. The Willow Corridor would pass through the heart of the undeveloped portion of the park, requiring either a major (one mile long) cut and fill across the river valley or an extensive overhead trestle. Either method would constitute a major feature that would ultimately change and dominate the ambiance of the park. Willow Creek is used predominately by fishers, with peak use occurring during the king salmon season, although it hosts all five salmon species. Silver salmon is the second biggest fishing attraction through late summer, with rainbow trout fishing third. Use is concentrated along the lower creek section between the Parks Highway and the confluence with the Susitna River. "Fishing tubes" are very popular on the creek. The park receives less use in the winter, with almost 100% being winter trail use.

The historic Lucky Shot Trail was a major transportation corridor from the Susitna River to the Lucky Shot Mine near Hatcher Pass, and passes through the park. This trail is still heavily used during the winter months as a major groomed winter trail. A historic trappers cabin remains at one of the proposed rail alignments across Willow Creek.

There is also a high potential for impacting prehistoric cultural resources within the Willow Creek SRA. The following reported archaeological sites are located within the park south of Willow Creek. All sites contain cache and house pits (cultural depressions) likely associated with late prehistoric Dena'ina culture:

- TYO-014: between 10 and 15 cultural depressions;
- TYO-041: at least 10 cultural depressions (two of them double celled);
- TYO-060: at least 12 cultural depressions;
- TYO-061: over 100 cultural depressions.

Based on the maps provided, two of these sites (TYO-014 and TYO-060) will be directly affected by the Willow Corridor. While the other reported sites are outside of the railroad footprint, they may be indirectly affected by staging activities associated with this project or by resulting increased development or other activity within the Willow Creek SRA. In addition, there could be other archaeological sites in the area that are currently unreported.

Additional information:

- a. Method Established: Legislatively Designated
- b. Date of Establishment: 1987
- c. Acreage: 3,000 acres
- d. Visitation:

Visitation Type	FY2007	FY 2006	FY 2005	FY 2004
Day Use	22,483	18,387	20,048	10,973
Camping	10,966	15,445	11,792	10,013

Willow Ck Floats (estimated)*	8,550	9,000	9,000	8,000
TOTAL	42,000	42,832	40,840	28,986

\*Approx 20-50 rafts per day, except 200+/day during king salmon season, 2 ave/raft

*NOTE: This visitor data is not statistically valid, numbers are approximate and should only be used to identify trends over time, and not taken literally.*

- e. Primary Recreation Types (by order of use, highest first): fishing, camping, floating/boating, winter trails, wildlife viewing, hunting
- f. Commercial Use: Guided and unguided float trips and fishing along Willow Creek and the Susitna River
- g. Historical Significance: Historic Lucky Shot Trail, trappers cabin, numerous cultural sites

2 **Nancy Lake State Recreation Area would be affected through negative impacts on neighboring recreational lands.** (DNR: Division of Parks and Outdoor Recreation)

The park was legislatively established in 1966 as one of the first state parks in the system due to its close proximity to both Anchorage and the growing Mat-Su Valley areas. The area still possessed its natural qualities, unlike the more heavily developed Big Lake area to the south. The 1983 Nancy Lake State Recreation Area Master Plan identifies the purpose of the park to "...provide a diversity of outdoor recreation activities appropriate to the area's resource character and regional setting". The same year, the Mat-Su Borough also created a Special Land Use District along the park boundaries to further protect the area's recreational values through its zoning laws. The park contains over 130 lakes, with about 25 miles of terrestrial trails, and 15 miles of canoe trails through its maze of lakes. Although the Willow Corridor will not directly pass through any portion of the park, it does skirt along the southwest corner within one mile of Red Shirt Lake, a heavily used lake for recreational fishing, boating, and winter trail use. Direct impacts to the park will be increased noise from nearby trains, and restricted winter trail access to the west and south.

Additional information:

- a. Method Established: Legislatively Designated
- b. Date of Establishment: 1966
- c. Acreage: 22,615 acres
- d. Visitation:

Visitation Type	FY2007	FY 2006	FY 2005	FY 2004
TOTAL	39,548	43,708	43,927	43,552

*NOTE: This visitor data is not statistically valid, numbers are approximate and should only be used to identify trends over time, and not taken literally.*

- e. Primary Recreation Types (by order of use, highest first): fishing, camping, canoeing, trails (canoe, hiking, winter trails), wildlife viewing
- f. Commercial Use: Canoe rental concession
- g. Historical Significance: Fishing camp established along the outlet stream of Red Shirt Lake and historic trail to Susitna Landing
- h. Special Concerns: Over 30 private inholding parcels exist within the park, with 88 parcels bordering on Red Shirt Lake alone. Most inholders enjoy living in/by the park

for its natural, quiet qualities. Residents along Red Shirt and Nancy Lake have organized homeowners associations.

3 **Little Susitna State Recreational River would be significantly impacted.** (DNR: Division of Mining, Land and Water)

Although the Little Susitna River is not managed by the Division of Parks, it is a high-use river corridor managed for the primary purpose of recreational float trips. Fishing, hunting, camping, boating and paddling are the primary uses. The river hosts all five species of salmon, and receives the heaviest sportfish use of all the Mat-Su Valley rivers. It provides a very popular float from the Parks Highway Bridge (River Mile 69.8) since there are two takeouts: Skeetna Lake at River Mile 54.6 (ties into the Nancy Lake Canoe Trail system); and Little Susitna Public Use Facility at River Mile 28.5 on the river. Additional bridge crossings along this corridor will detract from the wild qualities of this popular multi-day float trip. We strongly discourage any routes that will cross the river to maintain the current recreational integrity of this important river corridor.

Additional information:

- a. Acreage: 18,218 acres
- b. Visitation: Estimated annual use is 2000-3000 floats per year.
- c. Primary Recreation Types (by order of use, highest first): floating, fishing, camping, wildlife viewing, hunting
- d. Commercial Use: Guided and unguided float trips and fishing along the Little Susitna River

4 **Little Susitna Public Use Facility (LSPUF) would be significantly impacted.** (ADF&G: Division of Sportfish)

Owned by ADF&G, this facility is operated by the Division of Parks and Outdoor Recreation through a cooperative agreement. For this reason we feel qualified to comment on impacts to this facility. The LSPUF lies within the Susitna Flats State Game Refuge. It provides the only developed public access to the Little Susitna River south of the Parks Highway (approximately 70 river miles). It is a very popular destination for fishers, hunters, and other recreationists. Connector 1 will flank the LSPUF's east boundary which will affect users arriving at the "front door" of the facility, and displace a north-south trail that is used by the public to access hunting areas in the refuge. The Willow Corridor would cross the river at approximately River Mile 33, only one-quarter mile from seven developed riverside campsites maintained as part of the LSPUF. This will have an impact on the recreational experience that these remote sites offer.

Additional information:

- a. Date of Establishment: 1989
- b. Acreage: 720 acres
- c. Visitation:

Visitation	FY2007	FY 2006	FY 2005	FY 2004
TOTAL	30,340	22,503	18,908	22,770

*NOTE: This visitor data is not statistically valid, numbers are approximate and should only be used to identify trends over time, and not taken literally.*

- d. Primary Recreation Types (by order of use, highest first): fishing, camping, boating, hunting access, winter trail use, hunting, general
- e. Commercial Use: Guided and unguided fishing along the Little Susitna River

### **Regional Trail Impacts**

Both Nancy Lake and Willow Creek State Recreation Areas are linked by a myriad of winter trails (West Gateway trail system) that are an extremely important part of the region's attractiveness as a hub for winter recreation.

Between Red Shirt Lake and the Susitna Flats State Game Refuge are critical trail corridors, including the historic Iditarod Trail. These trails are used for routine recreation, competitive training and actual races. There are many sanctioned races on these trails, including dog mushing, snowmachining, and ski-joring. Additionally, these trails are critical winter transportational corridors to cabins, camps and lodges throughout the Susitna River Valley. Many of these corridor origination points are located in state park units.

No route completely eliminates trail impacts, but our preferred option keeps these impacts to a minimum. Since the area trail clubs will be providing specific comments regarding regional trail impacts, we will not elaborate further here other than impacts to Division of Parks programs.

### **State Trail Grooming Pool Program**

Trails throughout the proposed rail corridor are also part of the Mat-Su trails SnowTRAC Grooming Pool, and receives state funding from snowmachine registration fees to maintain and groom snowmachine trails in the winter. This program has been very successful, and the Division of Parks now administers grooming grants for well over 100 miles of trails between Big Lake and Denali State Park far to the north. The program has grown every year, with an objective to develop winter trail corridors throughout Southcentral Alaska, possibly connecting to the Denali and the Fairbanks North Star Boroughs. Such a network has great potential to create new economic opportunities for small businesses during a traditionally quiet part of the year. Part of the mission for the Division of Parks is to promote recreation in Alaska, and support the tourism industry. Winter recreation tourism has become an important part of the greater Willow area economy and steps should be taken to foster this endeavor, not weaken it.

### **Historical/Cultural Impacts**

Regional comments regarding cultural impacts were covered under a separate letter by the Division of Park's Office of History and Archaeology.

### **Barrier Issue**

The Willow Rail Corridor would effectively create 15 miles of a fence-like barrier between Willow Creek and Nancy Lake that will make cross-country travel east and west far more restrictive. A few strategically placed trail crossings are not sufficient to adequately resolve the barrier issue – even if they were at-grade crossings with elevated rail. Sub-grade (culvert) crossings are problematic due to pooling water, lack of snow, and the innate reluctance of animals (dog teams, wildlife) to enter such structures. Note that there are likely many more minor, non-dedicated trails, that traverse this country than what is indicated on most maps.

**Contiguous Public Land Block**

The area comprised by the combination of Nancy Lake State Recreation Area, the Little Susitna Recreational River, and the Susitna Flats State Game Refuge comprises a total of over 342,000 acres of lands reserved for public use. The South Houston – Houston – Connector 3 – Mac East route will completely avoid significant impacts to this block.

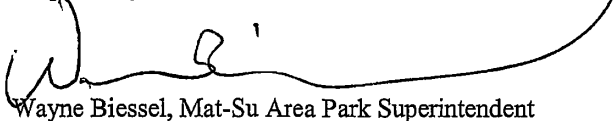
**Habitat Protection**

The Willow Corridor poses inherent risks to sensitive habitat that is very important for Alaskans in terms of recreational pursuit and for subsistence purposes (hunting, fishing, etc.). Each anadromous stream crossing is a new point source of contamination in the event of accidental discharges of hazardous materials. Eliminating the additional crossings of Willow Creek and the Little Susitna Rivers should be a high priority for this project.

**Conclusion**

Rail development through the Willow Corridor would be a major detriment to recreational values in that area, and will adversely affect the quality of life for many area residents. During the 2004 *Statewide Comprehensive Outdoor Recreation Plan* public survey, 98% of the respondents indicated that parks and outdoor recreation are important or very important to them. Once lost, these values will never be replaced – no matter what kind of mitigation ensues.

Respectfully,



Wayne Biessel, Mat-Su Area Park Superintendent

Cc: James King, DNR/DPOR Director  
Michael Bethe, DNR - Habitat  
Sam Means, DNR - Mining, Land and Water  
Don Perrin, DNR – Permitting  
Judy Bittner, DNR/SHPO  
Dave Rutz, ADF&G  
Mary Anderson, Mat-Su Area State Parks Citizens Advisory Board  
Willow Area Community Organization  
Dave Hanson, Mat-Su Borough

# STATE OF ALASKA

## DEPARTMENT OF NATURAL RESOURCES

### Office of Habitat Management and Permitting

#### SARAH PALIN, GOVERNOR

1800 GLENN HIGHWAY, SUITE 12  
PALMER, ALASKA 99645-6736

PHONE: (907) 745-7363

FAX: (907) 745-7369

### FISH HABITAT CASE NUMBER FH-07-IV-0428

November 26, 2007

Mr. Brian Lindamood  
Alaska Railroad Corporation  
P.O. Box 107500  
Anchorage AK 99510-7500

Re: Port MacKenzie Rail Extension Pre-Application Scoping Comments

Dear Mr. Lindamood;

Pursuant to AS 41.14.870 and AS 41.14.840, the Department of Natural Resources, Office of Habitat Management and Permitting (OHMP) has reviewed the proposed routes presented by the Alaska Railroad Corporation (ARRC) and the Matanuska-Susitna Borough for the Port MacKenzie Rail Extension Project. The purpose of this project is to provide rail access from the main ARRC track to the marine port near Point MacKenzie. The ARRC has asked that OHMP review the alternative routes and submit scoping comments based on our statutory permitting authority.

The three proposed routes divert south from the existing rail line near Willow, Houston (north and south alternatives) and Big Lake (see attached map). The rail line would then intersect, via three possible connector segments with two alternative routes (Mac-East and Mac-West) continuing southward to the Port Mackenzie area.

All of the potential routes for this project traverse a large geographic area and have the potential for negatively impacting a wide range of sensitive habitat areas. All work associated with this project that could potentially impact anadromous streams (AS 41.14.870) or could potentially block the free passage of fish (AS 41.14.840) requires a Fish Habitat Permit from the OHMP prior to commencement of any construction.

All comments contained herein are submitted as scoping comments and should be viewed as preliminary in nature. The OHMP offers the following comments:

#### Information Needs

- Comprehensive stream sampling to determine/confirm anadromy and the presence or absence of fish will be required. Fish usage patterns may have changed since the area was initially surveyed, and many smaller streams have yet to be sampled.
- Fragmentation of aquatic habitat is a concern. Hydrologic studies will be required to map wetland areas associated with fish bearing drainage systems. This project has the potential to isolate the free flow of water through these wetland areas, thus impacting fish-bearing waters.

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### **Routing and Design Considerations**

- To the maximum extent practicable, the route should be sited to avoid wetlands, fish-bearing streams and anadromous water bodies. Any preferred route should minimize the number of stream crossings, particularly over systems that produce significant numbers of salmon such as the Little Susitna River, Willow Creek, and streams in the Nancy Lake and Big Lake watersheds.
- The use of bridges to span floodplain areas is the preferred method of providing for the long-term free passage of fish on anadromous systems. Bridge abutments should be located outside the floodplain and above the ordinary high water mark (OHW) to minimize potential impacts to riparian vegetation and streambank integrity.
- Culverts should be designed using stream simulation methodology. The culvert design width at the OHW should be greater than or equal to 125-percent of the width of the stream at the OHW stage. The culvert grade should approximate the surrounding slope of the stream channel ( $\pm 1\%$ ). Culverts should be buried to approximately 40-percent of their diameter with substrate material that will remain dynamically stable at all expected flood discharge rates. Other design criteria will apply as well. We can meet later to flesh out the necessary design criteria for fish passage if you have any questions.
- It shall be the responsibility of the ARRC to ensure the free passage of fish throughout the lifetime of each stream crossing. Beavers are common along the various alternative routes. Culvert designs should account for long-term maintenance for fish passage and be of sufficient size (diameter) to discourage blockages associated with beaver dam construction.

### **Route Preferences**

OHMP prefers a route that would minimize potential impacts to wetland areas associated with fish bearing waterways, minimizes the total number of actual stream crossings and avoids crossings of important salmon producing systems such as the Little Susitna River, Willow Creek, and streams in the Nancy Lake and Big Lake watersheds whenever possible. These criteria appear to be met best with the following route:

1. Houston South
2. Houston
3. Connector 3
4. Mac East

### **Route Discussion**

This conclusion is based on our initial examination of existing data and aerial imagery and should be viewed as preliminary. Also note that we recognize that selection of final routing should be based on other considerations as well. Influencing factors should include fragmentation of wildlife habitat, the presence of cultural sites, native allotments, parks and refuges and historic land use patterns. Land ownership and the successful acquisition of Rights-of-Way will also significantly affect the final route selection.

Based on our analysis of existing materials, we believe that the Willow route will result in more fragmentation of fish and wildlife habitat, particularly in undeveloped areas, than the other alternatives. Crossings over Willow Creek and the Little Susitna River would be necessary.

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Because of the extended length of this route, the potential impacts to wetland areas associated with these drainages could be significant. It is the view of OHMP that this route (Willow) is the least preferable of all of the alternatives.

Thank you for the opportunity to comment on your project. If you have any questions, please feel free to contact me at the above address and telephone number or by e-mail at [mike\\_bethe@dnr.state.ak.us](mailto:mike_bethe@dnr.state.ak.us).

Sincerely,



Michael L. Bethe  
Habitat Biologist  
Area Manager  
Palmer Mat-Su Area

Attachment: ARRC Alternative Routes Map

-kab/mlb

Distribution: S. Joy, COE  
D. Rutz, ADF&G  
J. Hewitt, COE  
M. Fink, ADF&G  
K. Klein, ADF&G  
D. Perrin, OPMP

Enclosure  
State of Alaska Scoping Comments

**DEPARTMENT OF NATURAL RESOURCES**

DIVISION OF MINING, LAND AND WATER  
SOUTHCENTRAL REGION LAND OFFICE

SARAH PALIN, GOVERNOR

550 W. 7TH AVE., SUITE 900C  
ANCHORAGE, ALASKA 99501-3577

December 11, 2007

Brian Lindamood, P.E.  
P.O. Box 107500  
Alaska Railroad Corporation  
Anchorage, AK 99510


Dear Mr. Lindamood:

Subject: Port Mackenzie Rail Extension

The Southcentral Regional Office of the Division of Mining, Land and Water offers the following comments on your study of several possible routes for a railroad from Port Mackenzie to either Willow, Houston or Big Lake. These comments are of a general nature involving impacts to state land managed by this office. Should a specific alignment be chosen, we will modify our comments to address specific land management issues in more detail.

- **The land title interest needed by ARRC.** ARRC requests a fee simple interest in a 200 foot wide corridor to build and operate a railroad. SCRO authority to grant the appropriate interest in state land resides in AS 42.40.360 and .370. SCRO will also use the public process required by AS 38.05.035 and .945 to make the decision and give public notice to convey an interest in land to ARRC.
- **Roads, Trails and Utilities.** Pursuant to 11 AAC 51.015, the Southcentral Regional Office will ensure that any area of DMLW managed land approved for railroad corridor uses will be subject to existing ADL authorizations for roads, trails, utility, or other access easement purposes. The Southcentral Regional Office will also reserve additional ADL authorizations along existing roads, trails, utility, or access routes if the Southcentral Regional Office determines that these improvements represent interests of local, regional, or statewide significance. Any rail corridor area conveyance or authorization granted by the Division will stipulate the preservation of legislatively imposed public access routes described in AS 19.10.010 (section line easements), AS 19.30.400 (RS 2477 routes) and AS 38.05.127 (navigable or public waterways.) If considered necessary for project development, railroad corridor officials may petition the Division and/or the local Platting Authority for formal vacation of existing easements or rights of way on a case-by-case basis in accordance with

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Enclosure  
State of Alaska Scoping Comments

established regulations and procedures. Any such petition will be subject to review and comment by the Southcentral Regional Office in addition to other agencies, interested entities, and members of the public.

- **Susitna Area Plan** This plan provides general land management guidelines that must be followed when considering major transportation projects.  
<http://www.dnr.state.ak.us/mlw/planning/areaplans/susitna/index.cfm>

- **Willow Sub-Basin Area Plan.** Susitna Area Plan Revisions Affecting Willow Sub-Basin and Susitna Plans. For the past 25 years the use of state land in the area from Wasilla to the Talkeetna Y has been guided by the Willow Sub-Basin Area Plan (WSAP) and the South Parks Highway portion of the Susitna Area Plan (SAP), which the State Department of Natural Resources (DNR) adopted in 1982 and 1985 respectively. The amount of land owned by the state has decreased markedly during that period and the state is no longer the principal land owner in this area. Instead, the Borough, Mental Health Trust, University of Alaska, and CIRI are principal owners. Very little state land remains in areas near major population areas and that which remains consists of remnant parcels of generally small size. Our area plans have a design life of about 15-20 years and the WSAP and SAP need updating so that DNR decision making is based on more current information and therefore more pertinent.

In general, this plan provides the basis for state management of surface resources and land use, with decisions by the various DNR divisions (principally Agriculture, Forestry, Mining/Land/Water) to be based on the plan designations and management intent requirements identified in the area plan.

<http://www.dnr.state.ak.us/mlw/planning/areaplans/willow/index.cfm>

- **Fish Creek Management Plan.** Same comments as above.  
[http://www.dnr.state.ak.us/mlw/planning/mgtplans/fish\\_ck/index.htm](http://www.dnr.state.ak.us/mlw/planning/mgtplans/fish_ck/index.htm)
- **Susitna Basin Recreational Rivers Management Plan** In general, this management plan provides more specific guidelines for minimizing impacts to the Little Susitna River related to major transportation projects. Options to mitigate impacts to recreational use of the Little Susitna River corridor can be developed when a specific route is known. Maintaining access along the banks of the Little Susitna River will be a major consideration.

<http://www.dnr.state.ak.us/mlw/planning/mgtplans/susitna/index.htm>

- **Material Sales.** Material resources (sand, gravel, rock, peat) located outside of an approved conveyance or easement would be sold to ARRC. Under AS 38.05.110-38.05.120 and the regulations implementing these statutes allow these materials to be made available. Public Notice will be required consistent with AS 38.05.945.

Enclosure

State of Alaska Scoping Comments

- **Land Use Permits.** Man Camps, Staging Areas – Often large projects require areas adjacent to the project site to stage man, equipment and machines. Temporary locations used to facilitate the development of the ARRC project may be permitted under AS 38.05.850. Land Use Permits are the most commonly used tool for this activity. Review will be conducted for any request to use state land.
- **Alaska Coastal Management Program.** Any authorization requested to take place within the Coastal Zone may be subject to additional coordination and review by the Alaska Coastal Management Program.

Close cooperation between the ARRC and the Southcentral Regional Office is recommended as the rail route is more narrowly defined in order to facilitate the identification and protection of third party interests over the life of the project.

Sincerely,



Robert S. Means  
Natural Resource Manager

ROUTE ALTERNATIVES DEVELOPED BY ARRC



LEGEND

- Preliminary Alternatives\***
- Mac East
  - Mac West
  - Conn 1
  - Conn 2
  - Conn 3
  - Houston
  - Houston North
  - Houston South
  - Willow
  - Big Lake
- ARRC Track  
 ○ ARRC Milepost  
 — Highway  
 — Medium Rd.  
 — Minor Rd.  
 - - Iditarod Trail  
 — City Boundary  
 — Park or Refuge



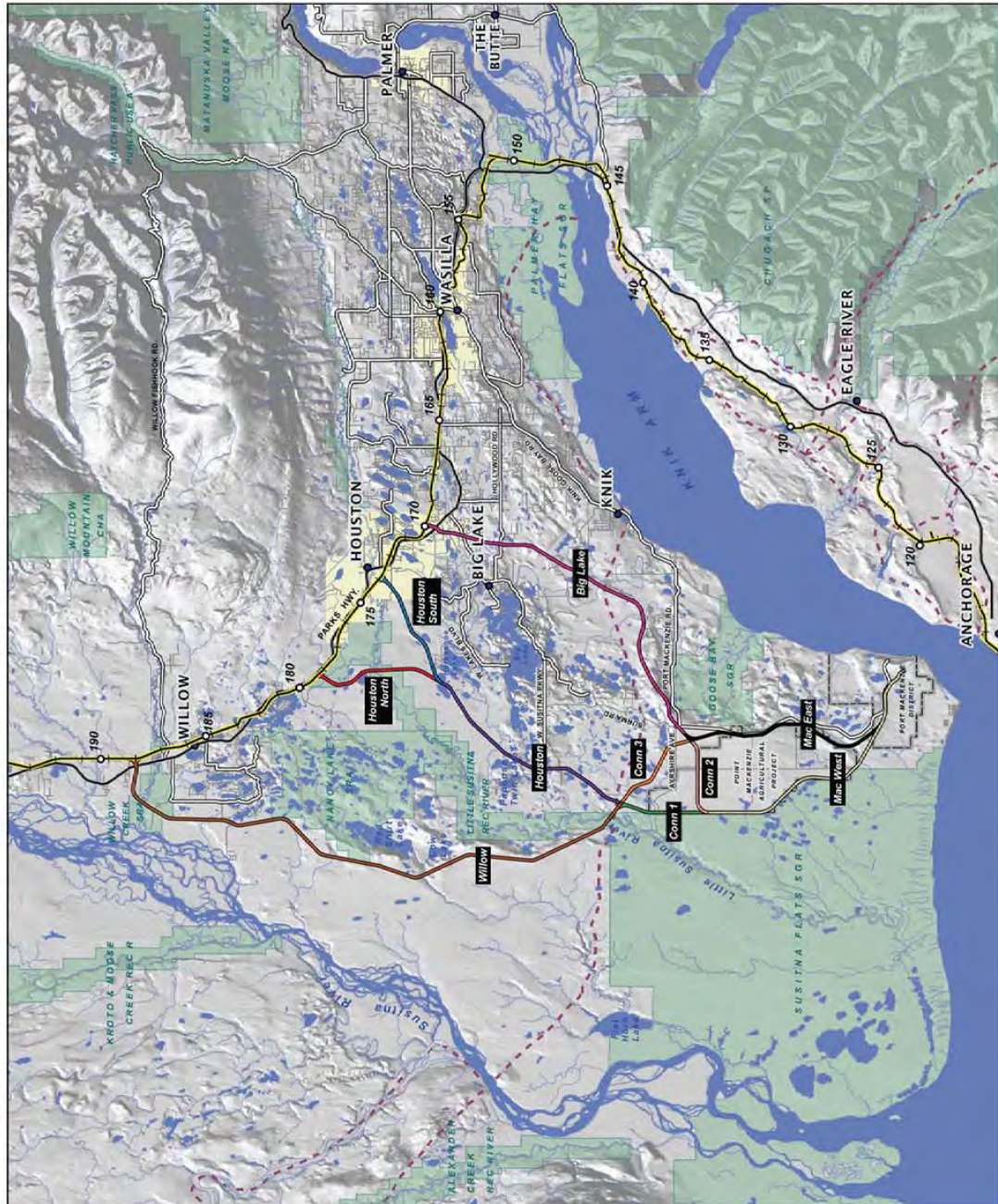
\*These lines generally represent corridors which are subject to further refinement.

This map represents a conceptual level of study, detail, and accuracy. The map is not intended to be used for engineering or construction purposes. The map is not intended to be used for engineering or construction purposes. The map is not intended to be used for engineering or construction purposes.

0 3 6 Miles

Date: November 5, 2007  
 Projection: Alaska State Plane Zone 4, NAD 83  
 Author: HDR Alaska, Inc.  
 Sources: ADOT, ARRC, HDR Alaska, Inc.,  
 USGS, TNS, Harrison, USGS.

Map developed by ARRC





# STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES  
OFFICE OF PROJECT MANAGEMENT AND PERMITTING

SEAN PARNELL, Governor

550 W. 7<sup>TH</sup> AVENUE, SUITE 1400  
ANCHORAGE, ALASKA 99501  
PH: (907) 269-8431 / FAX: (907) 334-8918

Victoria Rutson  
Chief, Section of Environmental Analysis  
Surface Transportation Board  
395 E Street, S.W.  
Washington, DC 20423-0001

December 31, 2009

Dear Ms. Rutson:

Re: STB Finance Docket No. 35095, Alaska Railroad Corporation Northern Rail – Petition for Exemption to Construct and Operate a Rail Line Extension to Port Mackenzie Alaska; Request for Information Regarding 4(f) Applicability, Measures to Minimize Harm, and *de minimis* Findings

The State of Alaska has reviewed the November 9<sup>th</sup> letter requesting input on section 4(f) resources that could be affected by the Port Mackenzie Rail Extension project. In response to the listed items 1-3 we offer the following comments.

- (1) We concur that the properties listed on page 2 of the memo meet the 4(f) criteria as explained in the memo.
- (2) Please add the following 4(f) resources not identified your letter.

RST 149, Nancy Lake – Susitna Trail

The Nancy Lake - Susitna trailhead is located in southcentral Alaska, at mile 67 of the parks highway. From the south shore of Nancy Lake, the trail heads southwestward to Susitna Landing. The route is located in the USGS 1:63,360 Anchorage C-8 and Tyonek C-1 and C-2 quadrangles and is approximately 26 miles long.

RST 118, Knik – Susitna Trail

The Knik-Susitna section of the Iditarod Trail begins in the town of Knik, on the north side of Knik Arm north of Anchorage. The trail heads northwest, joining ADL 200644, a 200 foot right of way which runs through T16N, R3W, Seward Meridian. This easement becomes ADL 222930, a 400 foot right-of-way which heads west to the trail's terminus at the Susitna River within T17N, R7E, SM. Total trail length is approximately 30 miles. The trail is shown on USGS 1:63,360 Anchorage B-8 and Tyonek C-2. These trails are a valid state interest for their historical and recreational values.

*“Develop, Conserve, and Enhance Natural Resources for Present and Future Alaskans.”*

- (3) “Whether proposed mitigation and measures to minimize harm would support a finding of *de minimis* use”

We have reviewed and considered the proposed mitigation and measures provided in your letter. While these mitigations and measures may be appropriate for initial analysis in mitigating potential impacts to any resource of the state, not just 4(f), we do not concur that implementation of these measures would result in *de minimis* impacts to the identified 4(f) resources. Moreover, there is no reasonably conceivable assemblage of mitigation measures that we could determine would render overall impacts to refuge lands and park lands *de minimis*.

These refuge areas, parks and recreational lands, typically with legislatively designated boundaries, were specifically designated in state law for the purposes of conserving the land and the values associated with that land. The replacement of impacted refuge lands with similar lands in other locations does not mitigate or restore habitat loss or other attributes within these 4(f) areas to a *de minimis* level. The listed mitigation and measures do not address the potential for direct or indirect harm to fish and wildlife, such as moose collisions along these routes. Further, they do not address the potential for damage from activities directly associated with railroad use, such as toxic spills or noise impacts. The existence of and the routine operation of a railroad in areas so closely associated with legislatively protected lands could directly alter the movement, migration and behavior of various fish and wildlife populations that rely on these largely undeveloped habitat areas.

The intent of the formative laws for these lands and current management directives contained in governing management plans and in regulation further demonstrates the impracticality of achieving a *de minimis* finding through mitigation, compensatory or otherwise. The comments below are in response to the proposed segment specific mitigation and measures listed in your letter.

*If the Surface Transportation Board authorizes the Mac West segment, the Applicant shall consult with the ADF&G to develop and implement measures, including consideration of replacing refuge acreage used for project-related rail right-of-way, to minimize impacts to the Susitna Flats State Game Refuge to the extent practicable.*

The Susitna Flats State Game Refuge (SFSGR) was established by the Alaska State Legislature in 1976 to protect (1) fish and wildlife habitat and populations, particularly waterfowl nesting, feeding and migration areas; moose calving areas; spring and fall bear feeding areas; salmon spawning and rearing habitats; and (2) public uses of fish and wildlife particularly waterfowl, moose and bear hunting; viewing; photography; and general recreation in a high quality environment. Mitigating the impact of the Mac West route alignment with replacement land in a different location would not make the impacts *de minimis* because the SFSGR was created specifically to protect the resources located in the Susitna Flats, not wildlife or habitat resources generally, or in another area. Land purchased as mitigation could not be added to the refuge and would not be under ADF&G management authority without legislative approval.

In addition, the ability of ADF&G to manage the SFSGR consistent with the goals, objectives, and policies of the SFSGR Management Plan would be compromised if the Mac West route was selected.



The plan directs ADF&G to manage the refuge (1) for the protection, preservation, and enhancement of fish and wildlife populations; and (2) to protect maintain and enhance public use of fish and wildlife and their habitat and general recreation in a high quality environment. All activities within the refuge must be consistent with these goals and compatible with the purposes for which the refuge was established.

This alignment along the eastern boundary of the SFSGR would act as a barrier to east/west movement of moose between the SFSGR and land outside the refuge including the Goose Bay State Game Refuge, which was established to protect natural habitat and game populations. It would make habitat that was protected specifically to benefit wildlife, including moose, inaccessible to moose. (SFSGR Management Plan Objective I.2. – Maintain natural movement corridors for moose to and from the refuge.)

The Mac West alignment affects all current overland access to the SFSGR from the Mat-Su Borough road system, including the Horseshoe Lake access road at the end of Holstein Ave., the Enstar pipeline trail, Ayrshire Ave/Little-Su River Road, Middle Lake Trail, Guernsey Road, and the South Trail. The only legal constructed road access, Ayrshire Ave/Little-Su River Road, into SFSGR, is in the NE corner of the refuge providing access to the Little Susitna Public Use Facility. The access road to Horseshoe Lake and the boat launch at the lake are located in the same section line easement and parallel the route of the Mac West alignment (at approximately mile 10). Restricting public access into the refuge to only these routes will only minimally maintain public access and most certainly will not enhance public access (SFSGR Objective II.1. – Maintain and where appropriate enhance public access to the refuge.) The impacts of restricting access into the refuge will not be mitigated through acreage replacement because the access is located in those particular locations in the northeast corner and down the east boundary of SFSGR because practical legal access does not exist elsewhere.

*If the Surface Transportation Board authorizes the Willow segment, the Applicant shall consult with ADF&G and ADNR to develop and implement measures, including consideration of replacing acreage used for project-related rail right-of-way, to minimize potential impacts to the Willow Creek State Recreation Area, Nancy Lakes State Recreation Area and Little Susitna River State Recreation River Area. The Applicant shall identify any additional trails, campsites, or other uses within the recreation areas that could be potentially affected by the project and shall coordinate with ADNR Division of Parks and Recreation (DPOR) to craft a site-specific crossing plan to eliminate or decrease potential impacts to the extent practicable.*

The Willow segment crosses both the Little Susitna State Recreational River and the Willow Creek State Recreation Area, and would impact the Nancy Lake State Park.

DNR does not concur that this measure would support a finding of *de minimis* use. The Willow segment would bi-sect the Willow Creek State Recreation Area. Impacts caused by a ~1/2-mile long by 50+ feet tall structure necessary to cross the Willow Creek Valley will alter the landscape significantly, irreparably and could adversely affect the activities, features, and attributes of the park. Such impacts cannot be mitigated through traditional means (such as acreage replacement) since the primary feature of the park is the Willow Creek Valley. Additionally, soundscape impacts cannot be eliminated and will permeate throughout a much greater area than the rail belt footprint, especially when elevated above grade. State Recreation Areas are usually large enough resource parks that noise attenuation is

accomplished by virtue of their size. The same noise premise holds true for all three conservation units in the Willow Corridor.

*If the Surface Transportation Board authorizes the **Houston North** segment, the Applicant shall consult with the ADNR to develop and implement measures to minimize potential impacts to the Little Susitna State Recreation River and the Nancy Lake Creek Junction public use site including replacement of any camping or other facilities within the right-of-way.*

DNR does not concur that the mitigation proposals for this segment would support a *de minimis* finding. The Houston North segment crosses the Little Susitna State Recreational River. The rail corridor could have substantial impact to the Little Susitna State Recreational River designation within the corridor footprint and could materially affect the ability to use the recreation corridor as designated. Though construction of a bridge would continue to allow for access on both sides of the river, the proposed rail corridor would likely cut off and isolate the associated uses. The acreage is linear for the most part and therefore, susceptible to substantial alteration by linear developments (e.g., a rail line) that would materially divide a narrow resource. Additionally, trails within a recreation designation are not individually protected; they are generally protected by virtue of occurring within the designation. A rail line may render portions of the recreational area unusable for recreation by virtue of isolating them from access. By virtue of it being a corridor, the protected area is wider than just the river and free access within the corridor could be compromised by the proposed rail line.

The Recreation Rivers were established by statute primarily for recreation (AS 41.23.400) and the primary purpose for management includes continued recreational and economic use while ensuring the scenic and natural integrity of the recreation river (AS 41.23.400(c)(2)). A railroad crossing the corridor would not be consistent with this management purpose.

*If the Surface Transportation Board authorizes the **Connector 1** segment, the Applicant shall consult with ADF&G and ADNR to determine if any trails in addition to official recognized trails within and surrounding the Little Susitna Public Use Facility have high enough levels of use to merit consideration for a grade-separated crossing.*

The Connector 1 route would impact the Susitna Flats State Game Refuge. See Mac West segment comments above.

*If the Surface Transportation Board authorizes the **Willow segment**, the Applicant shall provide two grade-separated crossings for the Lucky Shot Trail within the Willow Creek State Recreation Area and shall construct a bridge over Willow Creek with adequate clearance to ensure public access along the waterway during winter as well as summer conditions.*

See above discussion regarding Willow segment.

*If the Surface Transportation Board authorizes the **Willow segment**, the Applicant shall determine whether access would be made available to the parkland in the Nancy Lakes State Recreation Area west of the proposed right-of-way; if such accommodation is warranted but not practicable, the Applicant shall consult with ADNR DPOR to determine appropriate mitigation for the loss of public access to this area.*

See above discussion regarding Willow segment.

*If the Surface Transportation Board authorizes the **Willow or Houston North segments**, the Applicant shall construct a bridge over the Little Susitna River with adequate clearance to ensure public access along the waterway during winter as well as summer conditions.*

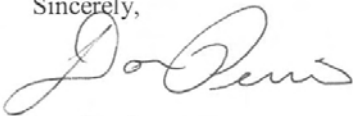
See above discussions regarding Willow and Houston North segments.

*If the Surface Transportation Board authorizes the **Mac West, Connector 1, and/or Willow segments**, the Applicant shall consult with ADFG to identify trails, campsites or other uses within the Susitna Flats State Game Refuge that would be affected and develop a site-specific crossing plan to maintain public access for Susitna Flats State Game Refuge.*

See above discussions regarding Mac West, Connector 1, and Willow segment.

Thank you for the opportunity to review the proposed 4(f) resources and mitigation measures for this project. We remain available to discuss our comments with you at your convenience. Please contact me at (907) 269-7476 or by email at [donald.perrin@alaska.gov](mailto:donald.perrin@alaska.gov) if you have questions regarding these comments or the State's management of these areas.

Sincerely,



Don Perrin  
Project Management and Permit Coordinator  
Alaska Department of Natural Resources

cc: Wayne Biessel, DNR  
Sandra Singer, DNR  
Mike Bethe, ADF&G  
Ellen Simpson, ADF&G  
Brian Lindamood, ARRC, Anchorage  
Dave Navecky, STB  
Alan Summerville, ICF Intl.



***SURFACE TRANSPORTATION BOARD***  
***Washington, DC 20423***

*Office of Economics, Environmental Analysis and Administration*

June 19, 2008

Judith Bittner  
State Historic Preservation Officer  
Alaska Office of History and Archaeology  
550 West 7th Ave., Suite 1310  
Anchorage, AK 99501-3565

Re: STB Finance Docket No. 35095, the Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Dear Ms. Bittner:

With this letter the Surface Transportation Board (Board) would like to formally initiate the Section 106 consultation process with your office, as recommended at 36 CFR 800, for the proposed Port MacKenzie Rail Extension. In addition, we are requesting your review and comment on the enclosed cultural resources work plan to support preparation of the Environmental Impact Statement (EIS) for the project. The work plan establishes guidelines for identifying and evaluating the impacts to cultural resources for each of the proposed project alternatives.

In brief, the Alaska Railroad Corporation has filed a petition with the Board, pursuant to 49 U.S.C. 10502, requesting authority to construct and operate a new rail line from Matanuska-Susitna Borough's Port MacKenzie to connect with the existing Alaska Railroad Corporation rail system between Wasilla and north of Willow, Alaska. The Board is the Federal agency responsible for deciding whether to grant authority for ARRC to construct and operate the proposed new rail line. The Section of Environmental Analysis (SEA) is the office within the Board responsible for preparing the appropriate documentation for compliance with the National Environmental Policy Act (NEPA). SEA is preparing an EIS to evaluate the potential environmental impacts of the proposed Port Mackenzie Rail Extension, including consideration of potential impacts to cultural resources. ICF International is serving as the independent third-party consultant to assist SEA with the EIS. Stephen R. Braund & Associates (SRB&A) is the cultural resources subcontractor to ICF International.

In March, Dave Navecky, SEA's Project Manager for the EIS, and SRB&A staff met with staff your office to discuss a methodology for assessing potential effects to cultural resources caused by the proposed action. SRB&A subsequently developed the enclosed work plan for identifying and evaluating cultural resources along the proposed new rail line. As you will see, the work plan proposes to use a combination of desktop predictive modeling and on-the-

ground testing to evaluate cultural resources within the vicinity of the project. The work plan outlines the process by which the project will satisfy the requirements of Section 106 of the National Historic Preservation Act and also provide adequate information on cultural resources for the EIS process to develop a determination of effects for the proposed project alternatives. We would like to receive any SHPO comments on or suggested revisions to the work plan by July 18, 2008.

We look forward to your comments on the enclosed work plan. If you have any questions about the project please do not hesitate to contact Dave Navecky, SEA Project Manager, at 202-245-0294, or Alan Summerville, ICF International Project Manager, at 703-934-3616.

Sincerely,

A handwritten signature in black ink, appearing to read "Victoria Rutson". The signature is fluid and cursive, with a large initial "V" and "R".

Victoria Rutson  
Chief  
Section of Environmental Analysis

Enclosure

STATE OF ALASKA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF PARKS AND OUTDOOR RECREATION  
OFFICE OF HISTORY AND ARCHAEOLOGY

SARAH PALIN, GOVERNOR

550 W. 7TH AVENUE, SUITE 1310  
ANCHORAGE, ALASKA 99501-3565  
PHONE: (907) 269-8721  
FAX: (907) 269-8908

July 23, 2008

File No.: 3130-1R Surface Transportation Board

SUBJECT: Rail Line Extension to Port MacKenzie, Alaska  
Initiation of Section 106 consultation

Victoria Rutson  
Chief, Section of Environmental Analysis  
Surface Transportation Board  
Office of Economics, Environmental Analysis and Administration  
Washington, DC 20423

Dear Ms. Rutson,

The State Historic Preservation Office received on June 23, 2008, your letter and the attached document titled *Cultural Resources Work Plan: Proposed Port MacKenzie Rail Extension Project, Port MacKenzie to Willow, Alaska STB Finance Docket No. 35095* by Stephen R. Braund & Associates (June 5, 2008). We have reviewed the referenced undertaking under Section 106 of the National Historic Preservation Act and have the following comments:

Definition of area of potential effect:

The *Cultural Resources Work Plan* defines the area of potential effect (APE) for direct effects as the 200 foot right-of-way and the construction footprint of other project components such as staging areas and material sources; the *Plan* also acknowledges that the APE for indirect effects is likely larger (page 5-6). Once we receive a more completely defined APE that includes future cumulative and other indirect effects we will be able to comment on the APE.

Study area and predictive model:

According to *Cultural Resources Work Plan*, the study area is defined as 1 mile on either side of alignment (p. 10). Cultural landscapes, historic districts and traditional cultural properties may be difficult to recognize by looking only at corridors. Instead, we encourage Surface Transportation Board to expand the study area to include the Susitna River-east/Willow/ Houston/Knik/Port MacKenzie region when identifying cultural resources and developing the predictive model. The ground truthing surveys may focus on the corridors. Remember also to involve the other consulting parties regarding the predictive model and the types of cultural resources that may be present in the project area.

The variables of the predictive model appear reasonable and we look forward to receiving the resulting GIS map showing the levels of cultural resource probability throughout the project area.

Methodology for completing Section 106 consultation:

We understand that the Section 106 process will be phased and combined with NEPA in accordance with 36 CFR 800.4 (b)(2), 800.5(a)(3) and 800.8 (c). To ensure that the requirements of the Section 106 process will be adequately covered, we developed the following outline based on our understanding of the

*Cultural Resources Work Plan* (pp. 8-12). The only changes we made were the addition of involving consulting parties at each step and developing only one legal agreement.

- Description of affected environment; 36 CFR 800.4 (Identify historic properties):
  - Literature review and back ground research of the project area
  - Describe previously reported cultural resources in project area
  - Develop a predictive model for cultural resources
  - Ground truth the model in summer of 2008
  - Involve consulting parties
- Determination of environmental consequences; 36 CFR 800.5 (Assess adverse effects):
  - Assume National Register eligibility of properties unless previously determined not eligible
  - Describe potential effects (both direct and indirect) to historic properties as a result of each alternative
  - Involve consulting parties
- After selection of final alternative; 36 CFR 800.4 and 800.5:
  - Pedestrian survey and sub-surface testing of the area of potential effect
  - Archaeological report with evaluations of National Register eligibility and recommendations regarding assessment of effect.
  - Involve consulting parties
  - Concurrence by SHPO of Surface Transportation Board's findings
- 36 CFR 800.6 (Resolution of adverse effects)
  - Will follow a programmatic agreement between STB and SHPO included in the EIS document
  - Involve consulting parties

Legal agreements

The *Cultural Resources Work Plan* states that a memorandum of agreement for mitigating adverse effects to the Iditarod National Historic Trail will be developed in addition to a programmatic agreement (p. 12). Under Section 106, only one legal document is necessary for an undertaking. Mitigation for Iditarod National Historic Trail should be incorporated into the PA.

Please contact Stefanie Ludwig (269-8720) or Doug Gasek (269-8726) if you have any questions or if we can be of further assistance.

Sincerely,



Judith E. Bittner  
State Historic Preservation Officer

JEB:slh

Cc: Fran Seager-Boss, Matanuska-Susitna Borough



***SURFACE TRANSPORTATION BOARD***

***Washington, DC 20423***

*Office of Economics, Environmental Analysis and Administration*

February 5, 2009

Ms. Judith Bittner  
State Historic Preservation Officer  
Department of Natural Resources  
Office of History and Archaeology  
550 West 7<sup>th</sup> Avenue, Suite 1310  
Anchorage, Alaska 99501-3565

Re: STB Finance Docket No. 35095 - Section 106 Process for the Alaska Railroad Corporation's Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Dear Ms. Bittner:

In a letter dated June 19, 2008, the Surface Transportation Board (Board) initiated the Section 106 consultation process with your office pursuant to 36 CFR 800, for the proposed Port MacKenzie Rail Extension. The purpose of this letter is to provide additional information about the alternative routes currently under consideration, and planned next steps in the cultural resource assessment process.

**Background / Project Description**

The Section of Environmental Analysis (SEA) is the office within the Board responsible for preparing the appropriate documentation for compliance with the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. SEA is preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of the proposed Port Mackenzie Rail Extension, including consideration of potential impacts to cultural resources. ICF International is serving as the independent third-party consultant to assist SEA with the EIS. Stephen R. Braund & Associates (SRB&A) is the cultural resources subcontractor to ICF International.

The proposed Port MacKenzie Rail Extension would connect Port MacKenzie to the existing ARRC rail system at a point between Wasilla and north of Willow, Alaska. The extension would require construction of between approximately 30 and 45 miles of new railroad track within a 200-foot right-of-way (ROW). Ten segments that form eight possible alternative routes are currently being considered. The longest alternative route currently under



consideration would connect to the existing ARRC rail line north of Willow, near Mile 190 of the George Parks Highway, and the shortest would connect to the rail line near Mile 167 of the George Parks Highway. Possible stream and river crossings include the Little Susitna River, Lake Creek, and Willow Creek as well as other small streams, depending on the specific alternative route. The proposed rail extension also would cross local roads, recreational trails, pipelines, and utilities. Additional elements of the proposed project include a siding along the existing rail line, and railroad support facilities including a terminal facility in the port district, access roads and communication towers.

The enclosed project overview map and United States Geological Survey (USGS) 1:63,360 Quadrangles (based on Anchorage B-8, C-8, Tyonek B-1, C-1, and D-1) depict the general area of the project and the alternative routes currently being considered as well as assist in delineating the Area of Potential Effect (APE) of the planned project [36 CFR Part 800.11(d)(1)]. The alternative routes pass through the following township and range sections:

- Township 14 North, Range 4 West, Sections 5, 7, 8, 17, 18, 20, 21, 22, 26, and 27 (Anchorage B-8 and Tyonek B-1)
- Township 14 North, Range 5 West, Sections 1, 12, and 12 (Tyonek B-1)
- Township 15 North, Range 4 West, Sections 4, 5, 6, 7, 8, 17, 20, 29, and 32 (Anchorage B-8 and Tyonek B-1)
- Township 15 North, Range 5 West, Sections 3, 10, 11, 12, 15, 22, 26, 27, 35, and 36 (Tyonek B-1)
- Township 16 North, Range 3 West, Sections 3, 9, 10, 16, 20, 21, 29, and 30 (Anchorage B-8 and C-8)
- Township 16 North, Range 4 West, Sections 25, 26, 27, 31, 32, 33, and 34 (Anchorage B-8 and Tyonek B-1)
- Township 16 North, Range 5 West, Sections 1, 4, 5, 9, 12, 13, 14, 15, 16, 22, 23, 25, 26, 27, 34, and 36 (Tyonek B-1 and C-1)
- Township 17 North, Range 3 West, Sections 1, 2, 6, 11, 12, 14, 23, 26, and 35 (Anchorage C-8)
- Township 17 North, Range 4 West, Sections 1, 2, 10, 11, 15, 16, 20, 21, 29, 30, and 31 (Anchorage C-8 and Tyonek C-1)
- Township 17 North, Range 5 West, Sections 5, 8, 9, 16, 21, 28, 32, and 33 (Tyonek C-1)
- Township 18 North, Range 3 West, Sections 20, 21, 27, 28, 31, 32, 33, and 35 (Anchorage C-8)
- Township 18 North, Range 4 West, Sections 3, 10, 11, 14, 23, 26, and 35 (Anchorage C-8)
- Township 18 North, Range 5 West, Sections 3, 9, 10, 16, 20, 21, 29, and 32 (Tyonek C-1)
- Township 19 North, Range 5 West, Sections 2, 3, 10, 15, 22, 27, and 34 (Tyonek C-1 and D-1)
- Township 20 North, Range 4 West, Sections 19, 30, and 31 (Tyonek D-1)
- Township 20 North, Range 5 West, Sections 35 and 36 (Tyonek D-1)

## **Cultural Resources Review To Date**

Initial examination of the Alaska Heritage Resource Survey (AHRS) records revealed 43 documented cultural resource sites within one mile of the alternative ROW routes, one of which has been found eligible for listing on the National Register of Historic Places (National Register). SRB&A is completing a review of the AHRS files, a review of previous surveys in the vicinity of the APE, and a review of available literature pertaining to the project area. SEA is also initiating consultation with potential Consulting Parties on this project, including Native American tribal organizations, to identify resources in the area.

If you have any questions about the project please do not hesitate to contact Dave Navecky, SEA Project Manager, at 202-245-0294, or Alan Summerville, ICF International Project Manager, at 703-934-3616.

Sincerely,

A handwritten signature in black ink, appearing to read "Victoria Rutson". The signature is fluid and cursive, with the first name "Victoria" written in a larger, more prominent script than the last name "Rutson".

Victoria Rutson  
Chief  
Section of Environmental Analysis

cc: Alan Summerville, ICF International  
Stephen R. Braund & Associates

Enclosures: Figures 1-6



***SURFACE TRANSPORTATION BOARD***  
***Washington, DC 20423***

*Office of Economics, Environmental Analysis and Administration*

February 27, 2009

Judith Bittner  
State Historic Preservation Officer  
Alaska Office of History and Archaeology  
550 West 7<sup>th</sup> Ave., Suite 1310  
Anchorage, AK 99501-3565

Re: STB Finance Docket No. 34658, The Alaska Railroad Corporation – Petition for  
Exemption to Construct and Operate a Rail Line Between North Pole and Delta Junction,  
Alaska

Dear Ms. Bittner:

As you know, the Board's Section of Environmental Analysis (SEA) has preliminarily determined that the above-referenced project may have an effect on historic properties on or eligible for inclusion on the National Register for Historic Places. Accordingly, SEA initiated the consultation process, pursuant to Section 800.14(b) of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f), with the Alaska State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), as well as the Federal agencies cooperating in the preparation of the Environmental Impact Statement (EIS) for this case.

SEA has reviewed your latest letter dated November 21, 2008, and the purpose of this letter is to respond to your comments in anticipation of our scheduled meeting/conference call with you on March 6, 2009. In addition to discussing your comments and our initial responses, we would also like to discuss with you the Programmatic Agreement for this proceeding. As you recall, we submitted a working draft of the Programmatic Agreement (PA) to your office for review on October 31, 2008 and we are interested in hearing your thoughts on the working draft of the PA.

On November 12, 2008, SEA also invited the ACHP to join in the consultation, and on November 24, 2008, ACHP agreed to participate. SEA will invite the ACHP to join in our March 6, 2009 meeting/conference call to review the comments and responses and address potential revisions or execution of the working draft PA.

## **Comments and Responses**

In your letter dated November 21, 2008, you concurred with the eligibility of seven of the ten prehistoric lithic sites SEA determined eligible for the National Register of Historic Places (NRHP) under criterion D in our letter dated October 10, 2008. Further analysis and treatment of the sites would be undertaken through the stipulations of the PA, once it is fully executed. You did not concur, however, with SEA's findings on three of the sites, XBD-336, XBD-340 and XBD-342, recommending instead that they be evaluated as a historic district. SEA, however, notes that your letters dated September 24, 2007 and July 16, 2008, indicated you were in agreement that these three sites were eligible for the NRHP. After discussion with our consultant, Northern Land Use Research (NLUR), while we do not oppose a district concept, SEA would prefer to treat these sites as presumed NRHP eligible and study them further under the stipulations of the PA, and only if they would be affected by a selected alternative.

Regarding the agricultural landscape near Delta Junction and Eielson Air Force Base, we would like to discuss your comments about "indirect effect" and "close proximity" further during the meeting/conference call, so that we may understand the scope of the identification effort and complete any necessary evaluation under the provisions of the PA. As you may recall, only one of the alternatives would directly affect the agricultural landscape.

Regarding the Trans Alaska Pipeline System (TAPS), you asked that it be evaluated for NRHP eligibility prior to an assessment of effects. While SEA has no objection to whether or not TAPS is considered NRHP eligible, TAPS is several hundred miles long and the undertaking would only cross the pipeline at one of two locations – both of which TAPS is underground. Given that the undertaking would not physically disturb TAPS in any way, and at the potential crossing locations TAPS would not be visually sensitive to changes on the surface, SEA concludes that there is not enough potential for effect to justify the cost of evaluating a linear resource of that length. Perhaps that responsibility falls under the jurisdiction of a different Federal agency that regulates the operation or lease of TAPS, and the cost of any NRHP eligibility study may more appropriately be borne by the company or companies who directly profit from the operation of TAPS.

Regarding the historic cabins and other features in the Area of Potential Effect (APE) for various alternatives in the Salchaket area, in 2006 you were in basic agreement with NLUR's findings. The site is a large historic Athabaskan village, which quite likely is eligible as a historic district under several criteria, and also possibly as a Traditional Cultural Property. In subsequent meetings and correspondence, the consensus has been that more extensive research would be conducted under the provisions of the PA, and only if that specific alternative were selected.

We look forward to discussing these matters during our March 6, 2009 meeting/conference call. Thank you for your continued cooperation in this case. If you have any questions, please do not hesitate to contact Dave Navecky, SEA's Project Manager, at 202-245-0294, or Alan Summerville, ICF's Project Manager, at 703-934-3616.

Sincerely,

A handwritten signature in black ink, appearing to read "Victoria Rutson". The signature is fluid and cursive, with the first name "Victoria" and last name "Rutson" clearly distinguishable.

Victoria Rutson  
Chief  
Section of Environmental Analysis

cc: ACHP



**SURFACE TRANSPORTATION BOARD**  
Washington, DC 20423

*Office of Economics, Environmental Analysis and Administration*

March 23, 2009

SEE DISTRIBUTION LIST

Re: STB Finance Docket No. 34658, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Between North Pole and Delta Junction, Alaska

Dear SEE DISTRIBUTION LIST:

The Alaska Railroad Corporation (ARRC) proposes to build a rail connection to the Matanuska-Susitna Borough's port at Port MacKenzie – referred to as the Port MacKenzie Rail Extension. A license from the Surface Transportation Board (STB) is a prerequisite for the construction and operation of the proposed rail line by ARRC. As part of the process for considering whether to grant such a license, the STB has initiated the Section 106 consultation process for the project with the State Historic Preservation Officer (SHPO), under the National Historic Preservation Act.

The purpose of this letter is to provide you with a summary of the Section 106 Consultation meeting held February 27, 2009 between Stephen R. Braund and Associates (SRB&A), Knik Tribal Council, the Dena'ina Cultural Historian from the Alaska Native Heritage Center, and the Matanuska-Susitna Borough (MSB) Historical Commission.

During the meeting, the Knik Tribal Council indicated their desire to have the discussion of Dena'ina be broadened to a cultural landscape level and focus on not only prehistoric and ethnographic resources, but also the contemporary cultural practices of the Dena'ina and how these practices reflect their past as well as show the Dena'ina as a living part of the landscape today. SEA agrees with the Knik Tribal Council's recommendation to evaluate certain aspects of the Dena'ina landscape within the Area of Potential Effects for the Port Mackenzie Rail Extension. SEA requests concurrence from the SHPO on this approach, and would like to consult further with you on the scope of the identification effort.

If you have any questions, please do not hesitate to contact Dave Navecky, SEA's Project Manager, at 202-245-0294, or Alan Summerville, ICF's Project Manager, at 703-934-3616.

Sincerely,



Victoria Rutson  
Chief  
Section of Environmental Analysis

cc: Stephen R. Braund & Associates  
Alan Summerville, ICF International

Enclosure: Meeting Notes

**Distribution List:**

Ms. Judith Bittner  
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Dan Stone  
Matanuska Susitna Borough Historic Commission  
Matanuska Susitna Borough  
350 East Dahlia Avenue  
Palmer, Alaska 99645



## Meeting Notes February 27, 2009

### Meeting Attendees:

Name	Organization
Stephen R. Braund	Stephen R. Braund and Associates
Paul Lawrence	Stephen R. Braund and Associates
Debra Call	Knik Tribal Council, President
Delia Call	Knik Tribal Council, Secretary Treasurer
Aaron Leggett	Dena'ina Cultural Historian, Alaska Native Heritage Center
Fran Seager-Boss	Matanuska Susitna Borough Historic Commission
Dan Stone	Matanuska Susitna Borough Historic Commission

### Meeting Summary:

The majority of the meeting focused on Knik Tribal Council's desire to have the discussion of Dena'ina be broadened to a cultural landscape level and focus on not only prehistoric and ethnographic resources, but also the contemporary cultural practices of the Dena'ina and how these practices reflect their past as well as show the Dena'ina as a living part of the landscape today.

The meeting began with overview of the project, discussion of project areas of potential effect (APE) and description of 2008 fieldwork survey efforts and results. Both the Knik Tribe and the MSB representatives had not read the consultation letters sent by the Surface Transportation Board (STB) and were unaware if their organizations had received the letters. During this portion of the meeting both entities made very few comments regarding SRB&A's methodology toward defining the project APEs and summary of 2008 fieldwork survey efforts and generally seemed to agree with SRB&A's approach.

SRB&A then proceeded to discuss the results of the dog sledding, recreation, homesteading, and agricultural cultural landscape research that was recommended by the State Historic Preservation Officer (SHPO) during a March 5, 2008 meeting. The Knik Tribal Council representatives strongly asserted that this approach was slanted toward a discussion of post-contact Euroamerican landscapes, and lacked any analysis or recognition of a Dena'ina cultural landscape in the study area. The Knik Tribal Council indicated that this approach relegated the discussion of Dena'ina to a simple documentation of individual cultural resource sites with no recognition of the broader cultural landscape of the Dena'ina in the study area as well as the ongoing cultural practices of Dena'ina descendants in the study area. They contended that the typical literature review and site documentation of Dena'ina in the study area was not adequate and that their culture was as deserving of a cultural landscape discussion as the other potential landscapes of dog sledding, recreation, homesteading, and agriculture. Several related themes that the Knik Tribe reiterated several times during this discussion included:

- Previous documentation of the Dena'ina culture has not captured the contemporary cultural ties to the study area, and a discussion of a Dena'ina cultural landscape would demonstrate such a connection. The theme of Dena'ina trails was brought up several times as an important component of the Dena'ina landscape within the study area.
- Cultural resource work should attempt to move beyond cultural preservation to cultural revitalization.
- There is a need for cultural resource analyses to bridge the prehistoric with contemporary cultural practices.
- The Tribe is tired of being characterized as “prehistoric.” They want acknowledgement of contemporary Dena'ina culture and how it ties to the past.
- Impact from rail extension was a barrier that the rail would create to access to cultural sites, trails, and areas

The MSB Historical Commission representatives agreed with the Knik Tribal Council's concerns regarding documentation of Dena'ina cultural resources and concurred that this documentation needed to expand to a broader cultural landscape discussion.

The meeting concluded with a brief discussion of the potential impacts to the Dena'ina cultural landscape created by the Port MacKenzie Rail Extension. The Knik Tribal Council discussed that besides the destruction of cultural resources within the rail line right-of-way, the main impact to their culture would be the restrictions in access to cultural sites, trails, and areas created by the rail extension. They claimed that the rail would create a legal barrier that would restrict access to culturally important areas, as well as prevent culturally important activities such as hunting, due to railroad regulations that limit such activities within certain distances of the rail line.



**SURFACE TRANSPORTATION BOARD**  
Washington, DC 20423

*Office of Economics, Environmental Analysis and Administration*

April 13, 2009

Ms. Judith Bittner  
State Historic Preservation Officer  
Alaska Department of Natural Resources  
Office of History and Archaeology  
550 West 7<sup>th</sup> Avenue, Suite 1310  
Anchorage, Alaska 99501-3565

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for  
Exemption to Construct and Operate a Rail Line to Port MacKenzie, Alaska

Dear Ms. Bittner:

In a letter dated June 19, 2008, the Surface Transportation Board's Section of Environmental Analysis (SEA) initiated the Section 106 consultation process with your office pursuant to 36 CFR 800, for the proposed Port MacKenzie Rail Extension. The purpose of this letter is to (1) provide you with a summary and notes (see Attachment 1) of a Section 106 consultation meeting held February 27, 2009 with the Knik Tribal Council, Dena'ina Cultural Historian from the Alaska Native Heritage Center, and Matanuska-Susitna Borough Historical Commission representatives, and (2) request concurrence with SEA's proposed approach to the Dena'ina landscape.

Steve Braund of Stephen R. Braund and Associates (SRB&A) represented SEA at the February 27 meeting. SRB&A is a member of the third-party contracting team that is assisting SEA in its environmental review and 106 consultations for the proposed project. During the meeting, the Knik Tribal Council indicated its desire to have the discussion of Dena'ina be broadened to a cultural landscape level in addition to prehistoric and ethnographic resources. The Knik Tribal Council also suggested that the Dena'ina discussion address the contemporary cultural practices of the Dena'ina and how these practices reflect their past, as well as to show the Dena'ina as a living component of today's landscape. SEA agrees with the Knik Tribal Council's recommendation to evaluate certain aspects of the Dena'ina landscape within the Area of Potential Effects for the Port Mackenzie Rail Extension. SEA requests concurrence from the SHPO on this approach, and would like to consult further with you on the scope of this identification effort. We will contact you in the near future to discuss this identification effort.

If you have any questions, please contact Dave Navecky, SEA's Project Manager, at 202-245-0294, or Alan Summerville of ICF International, Project Manager for SEA's third-party contracting team, at 703-934-3616.

Sincerely,



Victoria Rutson  
Chief  
Section of Environmental Analysis

Attachment

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State Historic Preservation Officer  
Alaska Department of Natural Resources  
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## ATTACHMENT 1

### Meeting Notes February 27, 2009

#### Meeting Attendees:

Name	Organization
Stephen R. Braund	Stephen R. Braund and Associates
Paul Lawrence	Stephen R. Braund and Associates
Debra Call	Knik Tribal Council, President
Delia Call	Knik Tribal Council, Secretary Treasurer
Aaron Leggett	Dena'ina Cultural Historian, Alaska Native Heritage Center
Fran Seager-Boss	Matanuska Susitna Borough Historic Commission
Dan Stone	Matanuska Susitna Borough Historic Commission

#### Meeting Summary:

The majority of the meeting focused on Knik Tribal Council's desire to have the discussion of Dena'ina be broadened to a cultural landscape level and focus on not only prehistoric and ethnographic resources, but also the contemporary cultural practices of the Dena'ina and how these practices reflect their past as well as show the Dena'ina as a living part of the landscape today.

The meeting began with overview of the project, discussion of project areas of potential effect (APE) and description of 2008 fieldwork survey efforts and results. Both the Knik Tribe and the MSB representatives had not read the consultation letters sent by the Surface Transportation Board (STB) and were unaware if their organizations had received the letters. During this portion of the meeting both entities made very few comments regarding SRB&A's methodology toward defining the project APEs and summary of 2008 fieldwork survey efforts and generally seemed to agree with SRB&A's approach.

SRB&A then proceeded to discuss the results of the dog sledding, recreation, homesteading, and agricultural cultural landscape research that was recommended by the State Historic Preservation Officer (SHPO) during a March 5, 2008 meeting. The Knik Tribal Council representatives strongly asserted that this approach was slanted toward a discussion of post-contact Euroamerican landscapes, and lacked any analysis or recognition of a Dena'ina cultural landscape in the study area. The Knik Tribal Council indicated that this approach relegated the discussion of Dena'ina to a simple documentation of individual cultural resource sites with no recognition of the broader cultural landscape of the Dena'ina in the study area as well as the ongoing cultural practices of Dena'ina descendants in the study area. They contended that the typical literature review and site documentation of Dena'ina in the study area was not adequate and that their culture was as deserving of a cultural landscape discussion as the other potential

landscapes of dog sledding, recreation, homesteading, and agriculture. Several related themes that the Knik Tribe reiterated several times during this discussion included:

- Previous documentation of the Dena'ina culture has not captured the contemporary cultural ties to the study area, and a discussion of a Dena'ina cultural landscape would demonstrate such a connection. The theme of Dena'ina trails was brought up several times as an important component of the Dena'ina landscape within the study area.
- Cultural resource work should attempt to move beyond cultural preservation to cultural revitalization.
- There is a need for cultural resource analyses to bridge the prehistoric with contemporary cultural practices.
- The Tribe is tired of being characterized as “prehistoric.” They want acknowledgement of contemporary Dena'ina culture and how it ties to the past.
- Impact from rail extension was a barrier that the rail would create to access to cultural sites, trails, and areas

The MSB Historical Commission representatives agreed with the Knik Tribal Council's concerns regarding documentation of Dena'ina cultural resources and concurred that this documentation needed to expand to a broader cultural landscape discussion.

The meeting concluded with a brief discussion of the potential impacts to the Dena'ina cultural landscape created by the Port MacKenzie Rail Extension. The Knik Tribal Council discussed that besides the destruction of cultural resources within the rail line right-of-way, the main impact to their culture would be the restrictions in access to cultural sites, trails, and areas created by the rail extension. They claimed that the rail would create a legal barrier that would restrict access to culturally important areas, as well as prevent culturally important activities such as hunting, due to railroad regulations that limit such activities within certain distances of the rail line.

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Surface Transportation B

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**STATE OF ALASKA**  
**DEPARTMENT OF NATURAL RESOURCES**  
**DIVISION OF PARKS AND OUTDOOR RECREATION**  
**OFFICE OF HISTORY AND ARCHAEOLOGY**

**SARAH PALIN, GOVERNOR**

550 W. 7TH AVENUE, SUITE 1310  
ANCHORAGE, ALASKA 99501-3565  
PHONE: (907) 269-8721  
FAX: (907) 269-8908

May 15, 2009

File No.: 3130-1R FRA/STB/Port Mackenzie Rail Extension

**SUBJECT:** Rail Line Extension to Port MacKenzie, Alaska  
Consultation with Knik Tribal Council, Dena'ina Cultural Historian and  
Matanuska-Susitna Borough Historical Commission

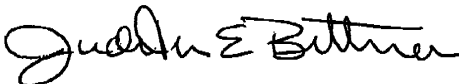
Victoria Rutson  
Chief, Section of Environmental Analysis  
Surface Transportation Board  
Office of Economics, Environmental Analysis and Administration  
Washington, DC 20423

Dear Ms. Rutson,

The State Historic Preservation Office has reviewed your correspondence regarding the referenced project (received on April 16, 2009) under Section 106 of the National Historic Preservation Act. Sharing the Dena'ina perspective with us is helpful. We concur that including analysis of a potential contemporary Dena'ina cultural landscape in your identification of historic properties under 36CFR800.4 will be beneficial.

Please contact Stefanie Ludwig (907-269-8720) if you have any questions or if we can be of further assistance.

Sincerely,



Judith E. Bittner  
State Historic Preservation Officer

JEB:sll





**SURFACE TRANSPORTATION BOARD**  
**Washington, DC 20423**

*Office of Economics, Environmental Analysis and Administration*

June 5, 2009

Ms. Judith Bittner  
State Historic Preservation Officer  
Alaska Department of Natural Resources  
Office of History and Archaeology  
550 West 7<sup>th</sup> Avenue, Suite 1310  
Anchorage, Alaska 99501-3565

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for  
Exemption to Construct and Operate a Rail Line to Port MacKenzie, Alaska

Dear Ms. Bittner:

In a letter dated June 19, 2008, the Surface Transportation Board's Section of Environmental Analysis (SEA) initiated the Section 106 consultation process with your office pursuant to 36 CFR 800, for the proposed Port MacKenzie Rail Extension. SEA would like to thank the Alaska SHPO for your response letter of May 15, 2009, indicating your concurrence with including an analysis of a potential contemporary Dena'ina cultural landscape in the Section 106 consultation process. The purpose of this letter is to provide you with a summary and notes (see Attachment 1) of a presentation and information gathering effort that occurred at the May 2009 monthly meeting of Matanuska-Susitna Borough Historical Preservation Commission (MSB HPC) that was held at the Knik Tribal Council (KTC) office in Wasilla.

Steve Braund of Stephen R. Braund and Associates (SRB&A) represented SEA at the May 15<sup>th</sup> meeting. SRB&A is a member of the third-party contracting team that is assisting SEA in its environmental review and 106 consultations for the proposed project. SRB&A presented a summary of the cultural resources research conducted for the project to date. In addition, MSB HPC requested to review the SRB&A research on the potential Dena'ina cultural landscape that had been compiled to date, and SEA wanted input from KTC and MSB HPC on how to document the components of this landscape. SEA continues to evaluate certain aspects of the Dena'ina landscape within the Area of Potential Effects for the Port Mackenzie Rail Extension, and will consult further with you on the scope of this identification effort, as it unfolds.

If you have any questions, please contact Dave Navecky, SEA's Project Manager, at 202-245-0294, or Alan Summerville of ICF International, Project Manager for SEA's third-party contracting team, at 703-934-3616.

Sincerely,



Victoria Rutson  
Chief  
Section of Environmental Analysis

Attachment

cc: Doug Gasek  
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Dan Stone  
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Palmer, Alaska 99645

## **ATTACHMENT 1**

### **Meeting Notes**

**May 15, 2009**

#### **Matanuska-Susitna Borough Historical Preservation Commission & Knik Tribal Council**

##### **Stephen R. Braund & Associates Consultation Meeting Summary**

On 5/15/09 Stephen Braund, Erik Hilsinger, and Paul Lawrence of Stephen R. Braund & Associates (SRB&A) attended the May 2009 monthly meeting of Matanuska-Susitna Borough Historical Preservation Commission (MSB HPC) that was held at the Knik Tribal Council (KTC) office in Wasilla. The MSB HPC had invited SRB&A to attend this meeting during the April 2009 monthly meeting and SRB&A attended as part of cultural resources consultation regarding the Port MacKenzie Rail Extension Project. The primary purpose of SRB&A's attending this meeting was to review the cultural resources research performed by SRB&A on the project in general, review the SRB&A research on the potential Dena'ina cultural landscape, and receive input from KTC and MSB HPC on how to document the components of this landscape. The following individuals were present at the meeting:

- LeRoi Heaven – Wasilla Knik Historical Society
- Bethany Buckingham – Dorothy Page Museum
- R. N. Marsh – MSB HPC
- Dan Stone – MSB
- Pat McClenahan – MSB Consultant
- Ron Bissett – MSB HPC
- John Stuart – MSB HPC
- Rob Meinhardt – MSB HPC / BIA Archaeology
- Al Plisousley – (Candle Lite Jazz) Fishhook Community Council
- Faith Plisousley – (Candle Lite Jazz) Fishhook Community Council
- Raymond Theodore - Knik Tribal Council
- Sherry Jackson – Museum of AK Transportation
- Rosie Choquette – Knik Tribal Council
- Richard Porter – Knik Tribal Council
- Jim L. Turner – F.C.C.
- Rosetta Alcantra – MSB HPC
- Fran Seager Boss – Cultural Resources MSB
- Wayne Simeon – Knik Tribal Council
- Vicki Cole – Cultural Resources MSB
- Erik Hilsinger – SRB&A
- Stephen Braund – SRB&A
- Paul Lawrence – SRB&A

Stephen Braund provided a brief overview of the Port MacKenzie Rail Extension cultural resources work completed by SRB&A to date. This included an overview of the project, discussion of project areas of potential effect (APEs) and description of 2008 fieldwork survey efforts and results. Because SRB&A had already presented on the four other cultural landscape themes of dog sledding, recreation, homesteading, and agriculture at the 4/3/09 MSB HPC consultation meeting, these topics were only briefly reviewed. Erik Hilsinger of SRB&A then provided a review of SRB&A research regarding the potential Dena'ina cultural landscape. Braund concluded the presentation with a list of questions to the MSB HPC and KTC addressing data gaps regarding Dena'ina historical and current cultural uses of the study area as well as asking for suggestions for how to proceed with additional documentation of the Dena'ina landscape.

The KTC and MSB HPC members recommended SRB&A conduct interviews with knowledgeable Dena'ina descendents who have information regarding historical and contemporary cultural uses of the study area. These knowledgeable individuals included people from both the Knik Tribe and Native Village of Eklutna. Several individuals mentioned the theme of documenting Dena'ina trails and travel routes within the study area as a possible avenue for discussing a Dena'ina cultural landscape. Rob Meinhardt of the MSB HPC also recommended using a broad period of significance when addressing a cultural landscape within the study area so that the full range of Dena'ina historical uses could be addressed, and for SRB&A to examine the landscape as a discontinuous district with multiple individual components (e.g., trails, archaeological sites, cultural viewsheds) contributing to an overall landscape. Stephen Braund agreed to contact the KTC to develop a plan for documenting the landscape and encouraged interested parties to send in their comments to the Surface Transportation Board if they had any additional concerns regarding cultural resources in the study area.



**SURFACE TRANSPORTATION BOARD**  
**Washington, DC 20423**

*Office of Economics, Environmental Analysis and Administration*

November 9, 2009

Linda Brenner  
Director of Community Development  
Matanuska-Susitna Borough  
350 E. Dahlia Avenue  
Palmer, AK 99645

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption for Construction and Operation of a Rail Line Extension to Port Mackenzie, Alaska; Request for Information Regarding 4(f) Applicability, Measures to Minimize Harm, and *de minimis* Findings

Dear Ms. Brenner:

The purpose of this letter is to request your input as the official with jurisdiction over the resources identified below regarding: (1) the applicability of Section 4(f) of the U.S. Department of Transportation Act of 1966 (also referred to as “Section 4(f)”) to the recreation resources that could be affected by the above-referenced project (also referred to as the “Port MacKenzie Rail Extension”); (2) whether there are any other resources under Matanuska-Susitna Borough (MSB) jurisdiction that qualify as Section 4(f) resources and would be affected by any of the alternatives for the proposed rail line; and (3) where the proposed project may require the use of a Section 4(f) resource, whether proposed mitigation and measures to minimize harm would support a finding of *de minimis* use.

**Section 4(f) Background**

The Surface Transportation Board’s (the Board) Section of Environmental Analysis (SEA) is in the process of developing a Draft Environmental Impact Statement (EIS) for the proposed Port MacKenzie Rail Extension. SEA anticipates that the Draft EIS will include a determination that some of the alternatives analyzed for the proposed Port MacKenzie Rail Extension could have an effect on one or more recreational resources located within MSB-managed land that may be protected under Section 4(f).

Section 4(f) applies to the actions of agencies within the U.S. Department of Transportation (U.S. DOT). In order for the Federal Railroad Administration (FRA), a U.S. DOT agency and a cooperating agency in the development of this EIS, to grant funding for the proposed Port MacKenzie Rail Extension, FRA must determine and evaluate the project’s potential effects to resources protected under Section 4(f). The Secretary of the Department of Transportation cannot approve a transportation project requiring the use of publicly owned parks, recreation areas, or wildlife and waterfowl refuges, or significant public or private historic sites unless there is no prudent and feasible alternative to using that land and the project includes all possible planning to minimize harm to the Section 4(f) resource.

Resources protected under Section 4(f) include “significant publicly owned public parks and recreational areas that are open to the public and significant publically owned wildlife and waterfowl refuges.” The term “significant” means that in comparing the availability and function of the park, recreational area or wildlife and waterfowl refuge, with the park, recreation or refuge objectives of the community or authority, the resource in question plays an important role in meeting those objectives. Further, one of its major purposes and functions must be for park, recreation, or as a refuge. If any of the resources identified below offer incidental, secondary, occasional or dispersed park, recreational or refuge activities, then this does not constitute a major purpose and the resource would not qualify for protection under Section 4(f).

### **Potential Section 4(f) Properties**

We have identified the following preliminary list of potential Section 4(f) properties that could be affected by one or more of the route alternatives for the proposed rail extension:

- *Point MacKenzie Trailhead Parking Lot.* The area provides public parking and access to the Figure 8 Loop Trail and other trails in the Point MacKenzie area.
- *West Gateway Trail.* The trail provides access from the Parks Highway across Willow Lake to the larger West Gateway Trails System further west.
- *Iron Dog Trail.* This multi-use winter trail provides access between the Big Lake area and the Susitna River.
- *Crooked Lake Trail.* This multi-use winter trail provides access between the Big Lake area and the Susitna River.
- *Iditarod Link Trail.* This multi-use winter trail provides access between the Iditarod and Flathorn Lake Trails.
- *Aurora Dog Mushers Trail System.* This trail system is part of a large recreational trail system that supports a variety of winter sports.
- *Figure 8 Lake Loop Trail.* This is a multi-use winter trail system that provides access to Point MacKenzie to the Susitna Flats State Game Refuge.
- *Herning Trail.* This designated RS 2477 trail would be crossed on MSB-owned land approximately two miles south of West Hollywood Road.

SEA, on behalf of FRA, respectfully requests that MSB determine whether the availability and function of these resources plays an important role in meeting the objectives of MSB and verify that one of the major purposes and functions of these resources is for park, recreation, or as a refuge. Additionally, if there any other potential Section 4(f) resources that would be affected by the proposed rail line that we have not identified, please provide information on these resources and their location in your reply.

### **Measures to Minimize Harm and *de minimis* Findings**

SEA is also developing measures to minimize potential impacts to Section 4(f) resources. SEA will include these mitigation measures in the Port MacKenzie Rail Extension Draft EIS. The measures will include voluntary mitigation developed by the Applicant, as well as

preliminary mitigation developed by SEA. Below is a list of measures we are considering including in the Draft EIS to mitigate potential impacts of the proposed rail line on the MSB-managed resources identified above.

- *The Applicant shall consult with land managers to develop a plan to ensure construction activities occur during the most appropriate timeframe, designate temporary recreational access points if main access routes must be obstructed during construction, and consult with the agencies with jurisdiction and user groups to limit potential impacts to recreation activities.*
- *The Applicant shall maintain public access to and from legally authorized trails and Matanuska-Susitna Borough recognized trail easements. The Applicant shall provide grade-separated crossing locations where the new rail line crosses these trails, although some trails may require some realignment to consolidate crossings. The Applicant shall work with trail user groups to design and construct grade-separated trail crossing.*
- *If the Surface Transportation Board authorizes the Mac West alternative segment, the Applicant shall consult with Alaska Department of Natural Resources and MSB to determine an appropriate location and relocate the Point Mackenzie Trailhead, Parking Lot, and the eastern end of the Figure 8 Loop Trail to another site.*
- *If the Surface Transportation Board authorizes the Mac West alternative segment, the Applicant shall provide grade-separated crossing(s) of the Figure 8 Loop Trail where the trail is located on public land and would be crossing by the Mac West alternative segment, or shall relocate the trail, in consultation with the Matanuska-Susitna Borough and trail user groups, such that the trail would not be crossed by the rail line.*

Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (49 U.S.C. 303), also known as SAFETEA-LU, amended Section 4(f) statutory requirements to include an exception for uses of protected land that would have a “*de minimis*” impact on that land. The U.S. Secretary of Transportation may make a finding of *de minimis* impact if the project “will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection” under Section 4(f), and if the “Secretary has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge.” To complete the Section 4(f) evaluation, SEA, on behalf of FRA, is requesting your input on whether a *de minimis* impact finding for any or all of the properties identified above could be reached through the implementation of the measures described above, or with the development and implementation of additional mitigation measures.

In summary, please indicate if you concur that: (1) this letter has identified all the MSB-managed Section 4(f) resources potentially affected by the proposed Port MacKenzie Rail Extension; (2) there are no other MSB-managed Section 4(f) resources potentially affected by the proposed project; and (3) the potential mitigation measures outlined in this letter would make the potential impacts *de minimis* for any of the Section 4(f) resources listed in this letter, and if so, which resources. If we have failed to identify all the MSB-managed Section 4(f) resources, please identify their location and provide a description of the resource in your reply. If MSB believes that additional mitigation measures would be required to make the potential impacts on Section 4(f) resources *de minimis*, please outline such measures in your reply. Please address your reply to Dave Navecky of my staff at the letterhead address, or as an email attachment to [David.Navecky@stb.dot.gov](mailto:David.Navecky@stb.dot.gov).



I thank you in advance for the expertise and effort needed in responding to the questions posed in this letter. If you have any questions, please do not hesitate to contact Dave Navecky, SEA's Project Manager, at 202-245-0294, or Alan Summerville of ICF International, Project Manager for SEA's third-party contracting team, at 703-934-3616. We would appreciate your reply by December 9, 2009.

Sincerely,

A handwritten signature in black ink, appearing to read "Victoria Rutson". The signature is fluid and cursive, with the first name "Victoria" and last name "Rutson" clearly distinguishable.

Victoria Rutson  
Chief  
Section of Environmental Analysis

**cc:**

Mr. John Winkle  
Federal Railroad Administration  
Office of Railroad Development  
1200 New Jersey Ave SE - Mail Stop 20  
Washington, DC 20590



## MATANUSKA-SUSITNA BOROUGH

### Community Development Department

350 East Dahlia Avenue • Palmer, AK 99645

Phone (907) 745-9869 • Fax (907) 745-9635

E-mail: [imb@matsugov.us](mailto:imb@matsugov.us)

February 1, 2010

Victoria Rutson, Chief  
Section of Environmental Analysis  
Surface Transportation Board  
Washington, D.C. 20423

Re: STB Finance Docket No. 35095, the Alaska Railroad Corporation-Petition for Exemption for Construction and Operation of a Rail Line Extension to Port Mackenzie, Alaska; Request for Information Regarding 4(f) Applicability, Measures to Minimize Harm, and *de minimis* Findings

Dear Ms. Rutson;

This letter is in response to your request for input from the official with jurisdiction over the resources identified below regarding: (1) the applicability of Section 4(f) of the U.S. Department of Transportation Act of 1966 to the recreation resources that could be affected by the above-referenced project (Port Mackenzie Rail Extension); (2) whether there are any other resources under Matanuska-Susitna Borough (MSB) jurisdiction that qualify as Section 4(f) resources and would be affected by any of the alternatives for the proposed rail line; and (3) where the proposed project may require the use of a Section 4(f) resource, whether proposed mitigation and measures to minimize harm would support a finding of *de minimis* use.

MSB has determined that some of the alternatives analyzed for the proposed Port Mackenzie Rail Extension will definitely have an effect on one or more recreational resources located within MSB-managed lands that may be protected under Section 4(f). MSB has reserved recreational public use easements along significant trail corridors that cross MSB-owned lands. These reserved trail corridors play an important role in meeting the objectives of MSB Community Development and the local communities through which the corridors travel, by preserving important recreational opportunities on public lands and access for private landowners to reach their remote parcels.

To facilitate the Surface Transportation Board's (STB) Section of Environmental Analysis (SEA) in developing a Draft Environmental Impact Statement (DEIS), MSB provides the following summary of impacts to the identified recreational resources.

- *Point Mackenzie Trailhead Parking Lot.* The Point Mackenzie Trailhead was constructed in 2000 using Alaska State Parks Snowmobile Trail Grant funding and is the only recreational trailhead in the Point Mackenzie area. It provides trailhead access to Susitna Flats State Game Refuge, Figure 8 Lake, Lake Lorraine and the Point Mackenzie area. All alternatives of the rail extension will significantly impact the trailhead to the degree of it being unusable as a trailhead. MSB has investigated relocating the Point Mackenzie trailhead approximately one mile to the north. Developing the trailhead east of the rail extension would require a separated-grade tube crossing to allow snowmobile and other recreational access to the west. Mitigation measures outlined in the STB letter dated November 9, 2009 for relocating the Point Mackenzie Trailhead would make the potential impacts *de minimis* for this Section 4(f) resource.

- *Figure 8 Lake Loop Trail.* Figure 8 Lake Loop Trail is identified and documented in the MSB Recreational Trails Plan but does not have legal easements. The trail is planned to be surveyed. The eastern end of the Figure 8 Lake Loop Trail would be impacted in two areas by the Mac West alternative. Mitigation measures outlined in the STB letter dated November 9, 2009 for relocating the eastern end of the Figure 8 Lake Loop Trail would make the potential impacts *de minimis* for this Section 4(f) resource.
- *Iditarod Link Trail.* Iditarod Link Trail has a legal easement and would be impacted by the Willow route alternative. Mitigation measures outlined in the STB letter dated November 9, 2009 for providing a grade-separated crossing would make the potential impacts *de minimis* for this Section 4(f) resource.
- *Crooked Lake Trail.* Crooked Lake Trail has a legal easement and is a heavily used trail providing access between Big Lake area and Susitna River and would be impacted by the Willow route alternative. Mitigation measures outlined in the STB letter dated November 9, 2009 for providing a grade-separated crossing would make the potential impacts *de minimis* for this Section 4(f) resource.
- *Iron Dog Trail.* Iron Dog Trail has a legal easement and is a heavily used trail providing access between Big Lake area and Susitna River, is used for the Iron Dog Snowmobile Race, and would be impacted by the Willow route alternative. Mitigation measures outlined in the STB letter dated November 9, 2009 for providing a grade-separated crossing would make the potential impacts *de minimis* for this Section 4(f) resource.
- *West Gateway Trail.* West Gateway Trail has a legal easement and is the main recreational access corridor out of Willow to the west. Where the proposed Willow route alternative crosses the West Gateway Trail, the alignment appears to be along the boundary between State of Alaska land and Alaska Department of Transportation Right-of Way ADL 216410. Regardless of land ownership, mitigation measures outlined in the STB letter dated November 9, 2009 for providing a grade-separated crossing would make the potential impacts *de minimis* for this Section 4(f) resource.
- *Aurora Dog Musers Trail System.* The Aurora Dog Musers Trail System is a well-developed multi-use trail network used for recreation, training and races. It is managed under a Cooperative Resource Management Agreement between the State of Alaska, Matanuska-Susitna Borough and the Aurora Dog Musers Club. Mitigation measures outlined in the STB letter dated November 9, 2009 for providing a grade-separated crossing would make the potential impacts *de minimis* for this Section 4(f) resource.
- *Herning Trail.* Herning Trail is a heavily used historic RS2477 trail (RST-1467) providing access from Knik northward to the Alaska Railroad. This trail is multi-use and an important transportation corridor. Mitigation measures outlined in the STB letter dated November 9, 2009 for providing a grade-separated crossing would make the potential impacts *de minimis* for this Section 4(f) resource.

Other potential Section 4(f) resources that would be affected by the proposed rail line include the following trail crossings:

- *Iditarod National Historic Trail.* Iditarod National Historic Trail is a heavily used historic RS2477 trail, known as the Knik-Susitna Trail (RST-118) through this area. The Willow Route will impact this trail in the W1/2, W1/2, Section 15, T16N, R04W, S.M., Alaska, where the trail right-of-way traverses MSB-owned land. The Big Lake Route will impact this trail in the SW1/4, Section 16, T16N, R03W, S.M., Alaska, where the trail right-of-way traverses MSB-owned land. Mitigation measures outlined in the STB letter dated November 9, 2009 for providing a grade-separated crossing would make the potential impacts *de minimis* for this Section 4(f) resource.

- *16 Mile Trail.* 16 Mile Trail is a heavily used multi-purpose trail with platted right-of-way. The Big Lake Route will impact this trail in the NE1/4, Section 29, T16N, R03W, S.M., Alaska, where the trail right-of-way is adjacent to MSB-owned land. Mitigation measures outlined in the STB letter dated November 9, 2009 for providing a grade-separated crossing would make the potential impacts *de minimis* for this Section 4(f) resource.
- *Big Lake Trail #13(Knik Connector Trail).* Big Lake Trail #13 (Knik Connector Trail) is identified and documented in the MSB Recreational Trails Plan as a multiple-use, predominantly winter trail but does not have an easement. The Big Lake Route will impact this trail near the southern edge of the N1/2, Section 30, T16N, R03W, S.M., Alaska, where the trail enters onto MSB-owned land. Mitigation measures outlined in the STB letter dated November 9, 2009 for providing a grade-separated crossing would make the potential impacts *de minimis* for this Section 4(f) resource.

The above-referenced trails/trailhead identifies all the MSB-managed Section 4(f) resources potentially affected by the proposed Port Mackenzie Rail Extension. There are no other MSB-managed Section 4(f) resources potentially affected by the proposed project. The potential mitigation measures outlined in the STB letter dated November 9, 2009 for providing grade-separated crossings and/or relocations of trails and trailheads would make the potential impacts *de minimis* for the Section 4(f) resources referenced above in this letter.

Once the final Port Mackenzie Rail Extension route has been identified, trail crossings can be looked at on a case by case basis to determine the most effective and cost-efficient mitigation measure for the specific Section 4(f) resource being impacted.

Sincerely,

A handwritten signature in black ink, appearing to read "Linda Brenner". The signature is fluid and cursive, with the first name "Linda" and last name "Brenner" clearly distinguishable.

Linda Brenner, Community Development Director



## **MATANUSKA-SUSITNA BOROUGH**

### **Borough Manager**

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December 16, 2008

Victoria J. Rutson  
Chief  
Section of Environmental Analysis  
Surface Transportation Board  
395 E Street, SW  
Washington, DC 20423

Subject: Port MacKenzie Bulk Materials Facility

Dear Ms. Rutson:

I am writing to provide you with information concerning the Matanuska-Susitna Borough's ("Borough") plans to develop a bi-modal bulk materials facility ("BMF") at Port MacKenzie, Alaska. As discussed below, the BMF is being developed by the Borough to accommodate the need for expansion of Port facilities to handle bulk material cargo to be transported to the Port by truck, independent of the planned rail line extension to Port MacKenzie ("Port MacKenzie Rail Extension Project")<sup>1</sup>. The factual statements in this letter concerning the BMF are supported by the Verified Statement of Mark Mayo, Director of the Planning and Use Department for the Borough, which is enclosed.

### **A. BMF Development at Port MacKenzie**

Port MacKenzie presently consists of a 500-foot bulkhead barge dock and a 1,200-foot deep-draft dock, as well as nearly 9,000 undeveloped upland acres available for commercial lease. All of this property is owned and operated by the Borough.

The Borough has recently received inquiries from potential shippers interested in shipping bulk materials in the near future through Port MacKenzie using heavy-haul trucks. Unfortunately, the current physical facilities at the Port are limited and are not able to handle these shipments under the current configuration. The only place to unload, stage and store bulk materials is occupied by a tenant holding a long-term lease. Moreover, moving bulk materials to the Port would require heavy-haul trucks that current roads at the Port likely cannot handle without some improvement or expansion.

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<sup>1</sup> As you are aware, the Port MacKenzie Rail Extension Project is currently pending before the Surface Transportation Board, Finance Docket No. 35095. In that proceeding, authority to operate and construct that rail construction project is being sought by the Alaska Railroad Corporation ("ARRC") with support by the Borough.

Victoria J. Rutson  
December 16, 2008  
Page 2 of 3

To accommodate the need for bulk materials service, the Borough has been working to develop a plan to upgrade roads, staging and storage areas at the Port. Moreover, the Borough has entered into a separate project management contract with ARRC to support the development of such facilities. ARRC has extensive experience as a rail carrier in dealing with bulk material unloading, staging and storage.

As the Borough continues to plan for the BMF and future Port development, it will consider the location of ARRC's proposed rail terminal (which is planned as part of the proposed Port MacKenzie Rail Extension Project) in its decision-making.<sup>2</sup> As a practical matter, the Borough must now be looking at ways to maximize development of the BMF in a manner that will not inhibit or interfere with possible plans for rail service and rail-related facilities or other future development on Port property. But none of the Borough's plans for the BMF are in any way dependent on the construction of the ARRC rail extension or its rail terminal.

#### **B. Port MacKenzie Rail Extension Project**

Separate and apart from the BMF plans, the Borough is supporting ARRC's plan to extend rail service to Port MacKenzie. That project is currently before the Board pursuant to ARRC's requests to build and operate the proposed rail extension. The Board's review of this Port MacKenzie Rail Extension Project under the National Environmental Policy Act ("NEPA") is ongoing.

ARRC's purpose for the Port MacKenzie Rail Extension Project is to establish a rail link between the Port and ARRC's main line, thereby providing customers and shippers cost effective rail transportation between the Port and Interior Alaska. ARRC, not the Borough, would construct and operate the rail extension.

In connection with the Port MacKenzie Rail Extension Project, ARRC also plans to build a terminal reserve that would accommodate several straight yard tracks, a smaller yard for the sorting, collection, and distribution of car-load traffic, and support facilities to include administration, crew facilities, fueling, light servicing and repair. These operations and facilities would have no connection to the planned truck service into the Port or the planned BMF facility.

#### **C. Independent Utility of the BMF and Rail Extension Projects**

As described above, the proposed BMF and the Rail Line Extension Project are separate projects serving distinct purpose and needs of the Port. They are not "connected actions", nor are the two projects dependent on one another to proceed. Under applicable NEPA regulations, two projects qualify as connected actions in just three situations: (1) when one action automatically triggers another action requiring an environmental impact statement; (2) when one action "cannot or will not proceed unless other actions are taken previously or simultaneously;" or (3) when one action is an "interdependent part[]" of a larger action and depends on that larger action for its justification. 40 C.F.R. § 1508.25(a)(1)(i)-(iii). Viewed another way, two projects are not

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<sup>2</sup> In connection with the BMF, the Borough (through ARRC its project manager) has been exploring with relevant federal, state and local agencies what permits and environmental compliance are needed to allow the project to proceed for service.

Victoria J. Rutson  
December 16, 2008

Page 3 of 3

connected actions if each has “**independent utility**”—i.e., “each of the two projects would have taken place with or without the other.” *Wetlands Action Network v. United States Army Corps of Engineers*, 222 F.3d 1105, 1118 (9th Cir. 2000).

Applying these principles, the Port MacKenzie Rail Extension Project and the BMF project plainly have independent utility. Each would be constructed even if the other were not. As explained above, the BMF is intended to upgrade the bulk storage and staging facilities at the Port to accommodate pending requests for truck deliveries of bulk materials. Similarly, the Port MacKenzie Rail Extension Project is valuable to the Borough (and ARRC) wholly apart from the BMF upgrades at the Port because it is being developed with the intent of providing another mode of transportation—rail service—to the Port. If for some reason the BMF project did not move forward in the near term with the BMF, the rail extension would still be pursued. And if the rail extension were not constructed, the BMF project would still move forward. Therefore, the BMF project and the Port MacKenzie Rail Extension Project are not connected actions under NEPA.

We hope this information provides useful background on the independent utility of the Port MacKenzie Rail Extension Project and the BMF project at the Port. Please let us know if you have any questions or need additional information.

Thank you for your time and consideration.

Sincerely,



John Duffy  
Borough Manager

VERIFIED STATEMENT  
OF  
MARK MAYO

1. My name is Mark Mayo. I am Director of the Planning and Land Use Department for the Matanuska-Susitna Borough (the “Borough”). My business address is 350 East Dahlia Avenue, Palmer, Alaska 99645.

2. I am responsible for planning, organizing, and directing through subordinate supervisors the activities of the Planning Department consisting of planning, platting, land use code compliance and cultural resources.

3. I previously worked for the Alaska Department of Transportation and Public Facilities as a Transportation Planning Manager for 26 years.

4. I have an undergraduate degree in Biology as well as a Masters Degree in Public Administration.

5. I am submitting this Verified Statement in connection with the Alaska Railroad Corporation (“ARRC”)’s plan to construct a rail extension from its main line near Wasilla, Alaska to Port MacKenzie (the “Port MacKenzie Rail Extension Project”). Port MacKenzie is owned and operated by the Borough.

**A. Port MacKenzie’s Bi-Modal Bulk Materials Facility (“BMF”)**

6. Port MacKenzie is a deepwater facility situated approximately 30 miles southwest of Wasilla and 5 miles north of Anchorage, across Knik Arm. Presently, the Port is home to a 500-foot bulkhead barge dock and a 1,200-foot deep-draft dock, as well as nearly 9,000 undeveloped upland acres available for commercial lease. The dock and the upland acreage are owned and operated by the Borough. The only overland way for freight to reach the Port today is via truck.



7. Recently, the Borough has been approached by potential shippers who desire the movement of bulk materials through Port MacKenzie to markets in the Far East. These proposed shipments would require the use of heavy-haul trucks, likely tandems, for the movement of the materials from the source area to the Port. Facilitating this movement would require the Borough to overcome two obstacles created by current physical limitations at the Port. First, the only area the port currently capable of unloading, staging and storing bulk materials is unusable due to a long-term lease (and a legal dispute with that tenant). Second, the existing road to the upper end of the ship loading conveyor is not serviceable at all during the winter months, and likely could not handle heavy-haul trucks during any season.

8. In order to address the Port's current physical limitations, the Borough is developing plans to upgrade the Port facilities. This project is known as the Bi-Modal Bulk Materials Facility ("BMF") project. As currently conceived, the BMF project involves a number of improvements to the Port, including construction of new freight and bulk materials storage and staging areas, construction of a new loop road for use by trucks hauling bulk materials into the Port area, and potential expansion of the Port's docking facilities. These planning efforts are proceeding quickly, but remain subject to change or revision as the need arises.

9. The most immediate need at the Port is development of facilities to handle the bulk materials requests the Borough has already received. The Borough has little experience with the requirements of such facilities. Accordingly, it hired ARRC to perform program management work for the BMF. This management contract has no connection whatsoever to the proposed rail extension, and is being handled through an entirely separate accounting process. The Borough chose ARRC to manage the BMF project because of ARRC's prior experience

with bulk materials facilities, and because ARRC could perform the required management functions in a timely manner.

10. As planning for the BMF and future Port development proceeds, the Borough will consider the location of ARRC's proposed rail terminal in its decision-making. The Borough intends to maximize development of the BMF in a way that will not inhibit or interfere with possible plans for rail service and rail-related facilities, or any other future development on Port property. The BMF project, however, will move forward regardless of whether the proposed rail extension and terminal are built. For the reasons I have explained, the Port needs upgraded bulk materials facilities to handle truck shipments now. Those upgrades have nothing to do with ARRC's proposed Port MacKenzie Rail Extension Project.

**B. ARRC's Port MacKenzie Rail Extension**

11. As the Board is aware, ARRC is proposing to build a rail extension from its main line to Port MacKenzie. According to documents filed with the Board, the purpose of the Port MacKenzie Rail Extension project is to establish a rail link between the Port and the ARRC rail system, providing customers and shippers with rail transportation between the Port and Interior Alaska. As part of the Port MacKenzie Rail Extension Project, ARRC would also build a terminal reserve that would accommodate several straight yard tracks capable of staging and/or storing unit trains, a smaller yard for the sorting, collection and distribution of car-load traffic, and support facilities to include administration, crew facilities, fueling, light servicing and repair. The Borough understands that this terminal reserve would be situated so as not to interfere with the development of the BMF (or other future Port development), but also that the reserve will be constructed as part of the rail extension project regardless of whether the BMF proceeds as planned.

12. The Borough is cooperating with ARRC in its plans to construct the Port MacKenzie Rail Extension Project, and views the project as a potential source of new traffic into the Port. ARRC, however, will construct and exclusively operate the line.

13. All of ARRC's plans for the Port MacKenzie Rail Extension Project are independent of the Borough's plans for the BMF project. In other words, ARRC plans to build the rail extension from its main line to the Port regardless of whether the Borough makes any other improvements to the Port, including the BMF.

**VERIFICATION**

I, MARK MAYO, verify under penalty of perjury under the laws of the United States that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this Verified Statement.

Executed on December 18, 2008.

Mark Mayo  
Mark Mayo



## MATANUSKA-SUSITNA BOROUGH

### Planning and Land Use Department

#### Planning Division

350 East Dahlia Avenue • Palmer, AK 99645

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November 18, 2008

David Navecky  
STB Finance Docket No. 35095  
Surface Transportation Board  
395 E Street, SW  
Washington, DC 20423

Dear Mr. Navecky,

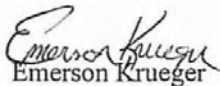
#### **Re: Port MacKenzie Rail Extension Project**

In light of the fact that the Point MacKenzie Community Council is currently inactive, I would like to provide a comment on one of the conceptual rail corridors described in the Preliminary Environmental and Alternatives Report. I have been working with the Point MacKenzie community, assisting with their planning efforts.

The Point MacKenzie Community Comprehensive Plan is currently being drafted by a team of community members. While drafting the land use chapter, the team identified a site for a future town center near the intersection of Point MacKenzie Road and Burma Road. Land suitable for a town center near essential infrastructure is scarce in the community. The location identified is near the only grocery store in Point MacKenzie. The town center concept is to create a pedestrian-oriented, mixed-use town center, to include places to meet friends and neighbors, venues for events and community meetings, a farmers market, and commercial services like a bank, Post Office, grocery store, and restaurants.

The Rail Project's Big Lake Alignment (MP B0.0-B2.5) transects the area identified for a future town center. Construction of a rail line through this corridor will impact the functionality and could likely preclude the use of this location as a town center.

Please contact me if you have any questions or require additional information.

  
Emerson Krueger

Planner

907-745-9526

[ekrueger@matsugov.us](mailto:ekrueger@matsugov.us)

**APPENDIX B**  
**TRIBAL AND GOVERNMENT-TO-**  
**GOVERNMENT CONSULTATION**

## B. TRIBAL AND GOVERNMENT-TO-GOVERNMENT CONSULTATION

This appendix contains the Section of Environmental Analysis's (SEA's) consultation plan (at the end of the appendix) and written correspondence with federally recognized tribes, tribal groups, and Alaska Native Regional Corporations. The consultation plan includes as an attachment to the plan, the tribal consultation letter template. The letter from SEA to the Native Village of Eklutna on February 12, 2008, is representative of eight others sent to tribal entities introducing them to the project and process, and informing them of upcoming public scoping meetings. The second letter is a sample letter sent to Eklutna, Incorporated on August 15, 2008, which is representative of eight others sent to tribal entities initiating formal government-to-government consultation. It includes a sample blank questionnaire that was sent to all 8 recipients of this letter.

Table B-1 lists all of the tribal entities with which SEA has corresponded and their dates of correspondence. Copies of correspondence between SEA and the tribal entities on the dates listed in Table B-1 follow the table.

<b>Table B-1</b>	
<b>Dates of Correspondence with Tribal Entities Consulted</b>	
<b>Tribal Entity</b>	<b>Dates of Correspondence</b>
<b>Federally Recognized Tribes</b>	
Native Village of Eklutna	2/12/08; 8/15/08; 2/5/09
Native Village of Tyonek	2/12/08; 8/15/08; 2/5/09; 9/03/08
<b>Tribal Groups</b>	
Cook Inlet Tribal Council	2/5/09
Chickaloon Village Traditional Council	2/12/08; 8/15/08; 2/5/09
Knik Tribal Council	2/12/08; 8/15/08; 2/5/09; 3/23/09 (see Appendix A for this letter)
<b>Alaska Native Regional Corporations</b>	
Cook Inlet Region, Incorporated	2/12/08; 8/15/08; 2/5/09
Chickaloon-Moose Creek Native Association, Incorporated	2/12/08; 8/15/08; 2/5/09
Eklutna, Incorporated	2/12/08; 8/15/08; 2/5/09; 3/16/09
Knikatu, Incorporated	2/12/08; 8/15/08; 2/5/09; 8/20/08
Tyonek Native Corporation	2/12/08; 8/15/08; 2/5/09



***SURFACE TRANSPORTATION BOARD  
Washington, DC 20423***

*Office of Economics, Environmental Analysis and Administration*

February 12, 2008

Don Karabelnikoff  
Tribal Administrator  
Native Village of Eklutna  
26339 Eklutna Village Road  
Chugiak, Alaska 99567

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Dear Mr. Karabelnikoff:

I am writing you on behalf of the Surface Transportation Board, a Federal agency based in Washington, DC. The Board is responsible for the economic regulation of freight railroads, and considers requests by freight railroads to construct and operate new rail lines. The Board is interested in your views regarding a new rail line construction proposal (described below). We are particularly interested in the proposed rail line construction's potential effects to tribal lands, rights, resources, religious and cultural sites and subsistence activities. At your request, we can meet with you to hear your views and provide additional information regarding the Board and its environmental review process. In addition, you are cordially invited to attend the scheduled public scoping meetings. If you plan to submit written comments, we appreciate receiving them by the close of the scoping comment period on **March 21, 2008**.

Description of the Proposal

The Alaska Railroad Corporation intends to file a petition with the Surface Transportation Board (Board), pursuant to 49 U.S.C. 10502, requesting authority to construct and operate a new rail line from Matanuska-Susitna Borough's Port MacKenzie to the existing Alaska Railroad Corporation rail system. The Board would be the Federal agency responsible for granting authority for the construction and operation of the proposed new rail line and for conducting government-to-government consultations with Federally-recognized tribes under Executive Order 13175 (65 FR 218), Consultation and Coordination with Indian Tribal Governments. The Section of Environmental Analysis (SEA) is the office within the Board responsible for preparing the appropriate National Environmental Policy Act (NEPA) documentation for railroad construction and operation cases that come before the Board.

The proposed Port MacKenzie Rail Extension would involve the construction and operation of a new rail line connecting the Matanuska-Susitna Borough's Port MacKenzie in south-central Alaska to a point on the Alaska Railroad Corporation main line between Wasilla and north of Willow, Alaska (see attached map). The proposed rail line would provide freight services between the Port and Interior Alaska and would support the Port's continuing development as an intermodal and bulk material resources export and import facility. Major elements of the proposed rail extension would include between 30 and 45 miles of new railroad track; a 200-foot-wide right-of-way; crossings of local roads, streams, trails, and utility corridors; sidings; and ancillary facilities. The anticipated train traffic would be two trains daily on average, with one train per day traveling in each direction.

#### The Board's Environmental Review Process

SEA initiated the scoping process for the preparation of an Environmental Impact Statement (EIS) for the Port Mackenzie Rail Extension Project with the publication of the Notice of Intent (NOI) to prepare an EIS in the *Federal Register* on February 12, 2008 and will be traveling to Alaska March 3<sup>rd</sup> through March 12<sup>th</sup> for public scoping meetings and meetings with Federal, state and local agencies and interested Federally-recognized tribes.

As I explained above, the Board is interested in your views regarding the project's potential effects to tribal lands, rights, resources, religious and cultural sites and subsistence activities. At your request, we can meet with you to hear your views and provide additional information regarding the EIS process. In addition, you are invited to attend the scheduled public scoping meetings. If you plan to submit written comments, we appreciate receiving them by the close of the scoping comment period on **March 21, 2008**.

The purpose of the NOI (copy attached) is to notify individuals and organizations interested in or affected by the proposed project of the decision to prepare an EIS and provide the draft Scope of Study for review and comment.

The public scoping meetings will be conducted using a workshop format during which interested persons may ask questions about the proposal and the Board's environmental review process, and advise SEA staff about potential environmental effects of the project. In keeping with the workshop format of the scoping meetings, there will be no formal presentations made by agency representatives. Rather, SEA staff will be available to answer questions and receive comments individually. Scoping meeting dates and locations are provided below.



**DATES AND LOCATIONS:** Public scoping meetings will held from 5 PM to 8 PM as follows:

DAY	DATE	LOCATION	ADDRESS
Monday	March 3, 2008	Knik Elementary School	6350 West Hollywood Wasilla, AK 99654
Tuesday	March 4, 2008	Big Lake Elementary School	3808 South Big Lake Road Big Lake, AK 99652
Wednesday	March 5, 2008	Willow Area Community Center	Mile 70 Parks Highway Willow, AK 99688
Thursday	March 6, 2008	Houston Middle School	12801 W. Hawk Lane Houston, AK 99694
Monday	March 10, 2008	Wasilla Multi-Use Sports Complex	1001 S. Mack Drive Wasilla, AK 99654
Tuesday	March 11, 2008	Anchorage Senior Center	1300 East 19 <sup>th</sup> Avenue Anchorage, AK 99501

Further information on the process for conducting government-to-government consultations for this project with Federally-recognized tribes under NEPA and other Federal laws will be provided in the near future.

David Navecky is SEA Project Manager for the project. ICF International is serving as the independent third-party consultant to SEA to assist with the NEPA review process. Alan Summerville is ICF's Project Manager for the project. If you have any questions or would like to arrange a meeting to discuss the project please do not hesitate to contact David Navecky at (202) 245-0294 or Alan Summerville at (703) 934-3616.

Sincerely,



Victoria Rutson  
Chief  
Section of Environmental Analysis

Attachments



***SURFACE TRANSPORTATION BOARD***  
***Washington, DC 20423***

*Office of Economics, Environmental Analysis and Administration*

August 15, 2008

Curtis McQueen, CEO  
Eklutna, Incorporated  
16515 Centerfield Dr., Suite 201  
Eagle River, AK 99577

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for  
Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Dear Curtis McQueen:

The purpose of this letter is initiate formal government-to-government consultation regarding the referenced project.

The Surface Transportation Board's (Board) previous letter of February 12, 2008 informed you of the proposed project and of our responsibility for preparing the appropriate National Environmental Policy Act (NEPA) documentation for railroad construction and operation cases that come before the Board, and for conducting government-to-government consultations with Federally recognized tribes under NEPA and other Federal laws.

The Board is interested in your views regarding the project's potential effects to Tribal lands, rights, resources, religious and cultural sites and subsistence activities. At your request, we can meet with you to hear your views and provide additional information regarding the Environmental Impact Statement process.

Your timely response will greatly assist us in incorporating your concerns into project development. For that purpose, we respectfully request that you complete the enclosed Project Consultation Options form and return it to us at your earliest convenience.

If you have any questions or would like to discuss the project please do not hesitate to contact Dave Navecky of my staff, at 202-245-0294 or Alan Summerville of ICF International, our independent third-party contractor, at 703-934-3616.

Sincerely,

A handwritten signature in black ink, appearing to read 'Victoria Rutson', with a stylized, cursive script.

Victoria Rutson  
Chief  
Section of Environmental Analysis

Enclosures:

ARRC Port MacKenzie Rail Extension Project Description  
Environmental Review Process Description  
Consultation Questionnaire

## CONSULTATION QUESTIONNAIRE

### **Eklutna, Incorporated**

Project Name: Port MacKenzie Rail Extension Project Environmental Impact Statement

STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Please check the appropriate response(s) from the list below and use the back of this form or additional sheets if you wish to make comments:

- ☐ We have no interests associated with this proposed project and further consultation is not required.
- ☐ There are or may be issues of concern associated with this proposed project and we request further consultation. We prefer:
- ☐ Meeting with the Board and cooperating agencies at a tribal facility.
- ☐ Communication with the Board and cooperating agencies by scheduled teleconference.
- ☐ We want to continue to receive project information by mail and participate in the public involvement process.

Name of **Eklutna, Incorporated** designated contact for this proposed project:

\_\_\_\_\_  
Please print

Phone: \_\_\_\_\_  
email: \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Please mail to:

David Navecky  
STB Finance Docket No. 35095  
Surface Transportation Board  
395 E Street, SW  
Washington, D.C. 20423-0001



**SURFACE TRANSPORTATION BOARD**  
**Washington, DC 20423**

*Office of Economics, Environmental Analysis and Administration*

February 5, 2009

SEE DISTRIBUTION LIST

Re: STB Finance Docket No. 35095 - Section 106 Process for the Alaska Railroad Corporation's Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

To whom it may concern:

The Alaska Railroad Corporation (ARRC) proposes to build a rail connection to the Matanuska-Susitna Borough's port at Port MacKenzie – referred to as the Port MacKenzie Rail Extension. A license from the Surface Transportation Board (STB) is a prerequisite for the construction and operation of the proposed rail line by ARRC. As part of the process in considering whether to grant such a license, the STB has initiated the Section 106 consultation process for the project with the State Historic Preservation Officer (SHPO), under the National Historic Preservation Act. The purpose of this letter is to ask the assistance of your tribal organization in identifying cultural resources, including traditional cultural properties, in the Port MacKenzie project area, and to learn whether your organization is interested in participating as a Consulting Party in the Section 106 process for this project.

**Background**

The Section of Environmental Analysis (SEA) is the office within the STB responsible for preparing the appropriate documentation for compliance with the National Environmental Policy Act as well as Section 106 of the National Historic Preservation Act. SEA is preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of the proposed Port MacKenzie Rail Extension, including consideration of potential impacts to cultural resources. ICF International is serving as the independent third-party consultant to assist SEA with the EIS. Stephen R. Braund & Associates (SRB&A) is the cultural resources subcontractor to ICF International.

The proposed Port MacKenzie Rail Extension would connect Port MacKenzie to the existing ARRC rail system at a point between Wasilla and north of Willow, Alaska. The extension would require construction of between approximately 30 and 45 miles of new railroad track within a 200-foot right-of-way (ROW). Ten segments that form eight

possible alternative routes are currently being considered (see attached figures). The longest alternative route currently under consideration would connect to the existing ARRC rail line north of Willow, near Mile 190 of the George Parks Highway, and the shortest would connect to the rail line near Mile 167 of the George Parks Highway. Possible stream and river crossings include the Little Susitna River, Lake Creek, and Willow Creek as well as other small streams, depending on the specific alternative route. The proposed rail extension also would cross local roads, recreational trails, pipelines, and utilities. Additional elements of the proposed project include a siding along the existing rail line, and railroad support facilities including a terminal facility in the port district, access roads and communication towers.

### **Cultural Resources Review**

Initial examination of the Alaska Heritage Resource Survey (AHRS) records revealed 43 documented cultural resource sites within one mile of the alternative ROW routes; one of sites has been found eligible for listing on the National Register of Historic Places (National Register). SRB&A is completing a review of the AHRS files, a review of previous surveys near the Area of Potential Effect (APE), and a review of available literature pertaining to the project area. The STB is also initiating consultation with potential Consulting Parties on this project, including Native American tribal organizations. A field survey and additional consultations with local Native groups, the SHPO, and other interested parties will be completed, as warranted. Interested parties will be kept informed of any new field activity.

### **Ways You May Choose to Participate**

The attached form provides you with several options on how you may choose to participate in ongoing consultations. The STB also requests your assistance in identifying cultural resources in the proposed project area. Please refer to the attached figures depicting the project area including the alternative routes. We are requesting information about places that you believe could be affected by the proposed project so that we can consider impact avoidance strategies. If you have information regarding cultural resources that could be affected by the proposed project, please identify and describe the subject properties, and return that information with the enclosed form. We also would be pleased to discuss with you any confidential concerns you may identify, as well as project details.

Your timely response will greatly assist us in incorporating your concerns into the EIS. For that purpose, we respectfully request that you complete the enclosed consultation options form and forward it to SEA within thirty days of your receipt of this correspondence. If we do not receive a response from you by March 16, 2009, we will assume that you have no concerns regarding historic properties that could be affected by the proposed project.

If you have any questions about the project please do not hesitate to contact Dave Navecky, SEA Project Manager, at 202-245-0294, or Alan Summerville, ICF International Project Manager, at 703-934-3616. Thank you for your time and effort in assisting us.

Sincerely,



Victoria Rutson  
Chief  
Section of Environmental Analysis

cc: Alan Summerville, ICF International  
Stephen R. Braund & Associates

Enclosures:  
Figures 1-6  
Project Consultation Options Form

**Distribution List:**

Native Village of Eklutna  
26339 Eklutna Village Road  
Chugiak, Alaska 99567  
Dorothy Cook, President  
Phone: 907-688-6020  
Fax: 907-688-6021

Eklutna, Incorporated  
16515 Centerfield Dr., Suite 201  
Eagle River, AK 99577  
Curtis McQueen, Chief Executive Officer  
Phone: 907-696-2828  
Fax: 907-696-2845

Knik Tribal Council  
PO Box 871565  
Wasilla, Alaska 99687-1565  
Jack Alcorn, Executive Director  
Phone: 907-373-7991

Fax: 907-373-2161

Knikatu, Incorporated  
P.O. Box 872130  
Wasilla, Alaska 99687-2130  
Raymond Theodore, President  
Phone: 907-376-2845  
Fax: 907-376-2847

Native Village of Tyonek  
PO Box 82009  
Tyonek, Alaska 99682-0009  
Angela Sandstol, President  
Phone: 907-583-2201  
Fax: 907-583-2442

Chickaloon Village Traditional Council  
P.O. Box 1105  
Chickaloon, AK 99674-1105  
Gary Harrison, Chief  
Phone: 907-745-0707  
Fax: 907-745-0709

Tyonek Native Corporation  
1689 C St., Suite 219  
Anchorage, AK 99501-5131  
Donita Hensley, President  
Phone: 907-272-0707  
Fax: 907-274-7125

Chickaloon-Moose Creek Native Association, Inc.  
P.O. Box 875046  
Wasilla, AK 99687  
Edith Baller, President  
Phone: 907-373-1145  
Fax: 907-373-1004

Cook Inlet Tribal Council  
3600 San Jeronimo Dr.  
Anchorage, AK 99508  
Gloria O'Niell, President and Chief Executive Officer  
Phone: 907-793-3600  
Fax: 907-793-3602



Cook Inlet Region, Inc.  
2525 C Street, Suite 500  
P.O. Box 93330  
Anchorage, Alaska 99509-3330  
Margaret L. Brown, President and Chief Executive Officer  
Phone: 907-274-8638  
Fax: 907-263-5183

## CONSULTATION QUESTIONNAIRE

### Native Village of Tyonek

Project Name: Port MacKenzie Rail Extension Project Environmental Impact Statement

STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Please check the appropriate response(s) from the list below and use the back of this form or additional sheets if you wish to make comments:

☐ We have no interests associated with this proposed project and further consultation is not required.

☐ There are or may be issues of concern associated with this proposed project and we request further consultation. We prefer:

☐ Meeting with the Board and cooperating agencies at a tribal facility.

☐ Communication with the Board and cooperating agencies by scheduled teleconference.

☒ We want to continue to receive project information by mail and participate in the public involvement process.

Name of Native Village of Tyonek designated contact for this proposed project:

Ethan Kaufman  
Please print

Phone: 583-2201  
email: ethan-ka@tyonek.net

Signed: Angela D. Sandstel

Date: 9-3-08

Please mail to:

David Navecky  
STB Finance Docket No. 35095  
Surface Transportation Board  
395 E Street, SW  
Washington, D.C. 20423-0001

**Options for Consultations with the Surface Transportation Board  
Regarding the Alaska Railroad Corporation's Proposed Port MacKenzie Rail Extension**

Eklutna, Incorporated

**Requested Consultation Status**

Please check the appropriate response(s) from the list below and use the back of this form or additional sheets if you wish to make comments:

- ☐ There are no known traditional religious or cultural places present or within the vicinity of the proposed project and further consultation is not requested.
- ☐ There are or may be traditional religious or cultural resources present or within the vicinity of the proposed project, further consultation is requested, and we would like to be considered a Consulting Party.
- ☐ We will continue consultations for this proposed project directly with the Surface Transportation Board Section of Environmental Analysis (SEA), further consultation is requested, and we would like to be considered a Consulting Party.
- ☒ We have no interest associated with this proposed project and further consultation is not required.

**Contact Information**

If you have chosen to participate in further consultation with SEA, please indicate the manner in which you wish to continue consultation by providing the relevant contact information below:

Mail Address:

Phone:

Fax:

E-mail:

Other (please describe):

Printed Name of Designated Contact for this Project

Phone: \_\_\_\_\_

Signed: \_\_\_\_\_

Curtis McQueen, Chief Executive Officer

Date: 3/16/09

Please mail to: Dave Navecky, SEA Project Manager, Surface Transportation Board, 395 E Street, SW  
Washington, DC 20423. Or, fax to: Dave Navecky at 202-245-0454

*Rec'd 3/31/09*

EI-15639

## CONSULTATION QUESTIONNAIRE

### Knikatnu, Incorporated

Project Name: Port MacKenzie Rail Extension Project Environmental Impact Statement

STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Please check the appropriate response(s) from the list below and use the back of this form or additional sheets if you wish to make comments:

- ☐ We have no interests associated with this proposed project and further consultation is not required.
- ☒ There are or may be issues of concern associated with this proposed project and we request further consultation. We prefer:
- ☒ Meeting with the Board and cooperating agencies at a tribal facility.
- ☐ Communication with the Board and cooperating agencies by scheduled teleconference.
- ☒ We want to continue to receive project information by mail and participate in the public involvement process.

Name of **Knikatnu, Incorporated** designated contact for this proposed project:

Raymond Theodore  
Please print

Phone: (907) 376-2845  
email: Knikcorp@Gci.net

Signed: Raymond Theodore

Date: August 29, 2008

Please mail to:

David Navecky  
STB Finance Docket No. 35095  
Surface Transportation Board  
395 E Street, SW  
Washington, D.C. 20423-0001

# Surface Transportation Board Environmental Impact Statement on Alaska Railroad Corporation's Proposed Port MacKenzie Rail Extension

## Government-to-Government Consultation and Coordination Plan

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### Introduction

Executive Order (EO) 13175 (65 FR 218), Consultation and Coordination with Indian Tribal Governments (November 6, 2000) directs Federal agencies to establish regular and meaningful consultation and collaboration with officials of Federally recognized Tribal Governments (Tribes) in the development of Federal policies or decisions that have Tribal implications. The Environmental Impact Statement (EIS) for Alaska Railroad Corporation's (ARRC) proposed Port MacKenzie Rail Extension will culminate in a decision by the Surface Transportation Board (Board) and, as appropriate, subsequent permit decisions by other Federal agencies that constitute Federal decisions subject to the provisions of EO 13175. The Federal agencies that are cooperating in the preparation of the EIS for this project are the U.S. Army Corps of Engineers – Alaska District, Federal Railroad Administration, and U.S. Coast Guard – Seventeenth Coast Guard District.

The proposed Port MacKenzie Rail Extension has the potential to directly affect the environment, resources and rights of Tribes located in south-central Alaska in the vicinity of the Knik Arm, Big Lake and the Little Susitna River. Potential effects to Tribal lands, rights, resources, religious or cultural sites and subsistence activities need to be identified, evaluated and discussed with Tribal Governments in order to comply with EO 13175, Section 106 of the National Historic Preservation Act of 1966 (see also 36 CFR Part 800, August 5, 2001) and other Federal regulations and policies.

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## **Federally Recognized Tribal Governments in the Project Area**

The U.S. Department of Interior, Bureau of Indian Affairs maintains a list of 561 Federally Recognized Tribes (73 FR 66, April 4, 2008). Alaska Tribes in proximity to the proposed Port MacKenzie Rail Extension have been identified from this list. Proximity is defined as in or near the Little Susitna River and Knik Arm watersheds. The following Tribes, Tribal groups and Native corporations were notified by letter dated February 12, 2008 of the scoping process for the Port Mackenzie Rail Extension EIS, and have been advised that further information regarding government-to-government coordination would be forthcoming.

### **FEDERALLY RECOGNIZED TRIBES**

Chickaloon Village Traditional Council  
Knik Tribal Council  
Native Village of Eklutna  
Native Village of Tyonek

### **ALASKA NATIVE CORPORATIONS**

Chickaloon-Moose Creek Native Association, Inc.  
Cook Inlet Region, Inc.  
Eklutna, Incorporated  
Knikatnu, Incorporated  
Tyonek Native Corporation

---

## **Objectives of Consultation and Coordination**

Consultation and coordination is the process of seeking, discussing, and considering the views of Tribes. Two-way communication that works toward consensus and reflects the concerns of the affected Tribes is the primary objective for the Board's consultation and coordination plan. Tribal sovereignty, culture, traditional values and customs will be respected during the consultation process.

The Board, U.S. Coast Guard and Federal Railroad Administration do not have specific guidance documents for consultation and coordination with Tribal Governments. The U.S. Army Corps of Engineers – Alaska District is the only Federal cooperating agency with established guidance. The Board considered this guidance, as well as guidance documents from the U.S. Department of Defense, U.S. Environmental Protection Agency - Region 10, and the State of Alaska while

developing this consultation and coordination plan for the Port MacKenzie Rail Extension EIS. Specific objectives for consultation include:

1. Engage all potentially affected Tribes early in the EIS process to identify issues that should be researched and analyzed in the EIS.
2. Maintain open and active communications with Tribes throughout the EIS process to identify places of traditional religious or cultural importance and potential effects to Tribal lands, rights, resources or subsistence activities in the vicinity of the proposed project.
3. Report to the Tribes in a credible and understandable manner on issues and concerns raised during the scoping process.
4. Respond to issues raised by the Tribes during scoping and on the Draft EIS.
5. Respond to issues raised by the Tribes on the Final EIS.

---

## **Implementation Plan**

Providing Tribes with the opportunity to participate in the public scoping process is not the same as government-to-government consultation and coordination. At a minimum, Tribal Governments will be given an opportunity to consult at the start of the project and again prior to decision making. Additional coordination will take place as determined necessary or desirable by the Board, cooperating agencies and Tribal Governments. The following sequence of actions will be completed:

1. Contact each Tribal entity (as listed in Section 2.0) by telephone to confirm the name, title and address of current leadership.
2. Transmit a Tribal Consultation Initiation letter and Consultation Questionnaire to each Tribal entity describing the EIS and government-to-government consultation and coordination process, describing the proposed project and soliciting Tribal input on potential effects of the proposed project on Tribal lands, rights, resources, religious or cultural sites and subsistence activities. The consultation questionnaire offers several options for Tribal consultation.
  - Face-to-face meetings with the Board and cooperating agencies at a Tribal facility,
  - Scheduled teleconferences with the Board and cooperating agencies,
  - No further involvement in government-to-government consultation during the EIS process, or
  - Continued receipt of project information by mail and participation through the public involvement process.
3. Conduct initial meetings or teleconferences with interested Tribes and develop an agreement and process for continued consultation and coordination throughout EIS development.

4. Document the government-to-government coordination with each Tribe for inclusion in the EIS and Administrative Record.



---

## **Attachments**

Tribal consultation materials include:

- Tribal Consultation Initiation letter
- Port MacKenzie Rail Extension Project Description
- Environmental Review Process Description
- Consultation Questionnaire
- Preliminary List of Tribal Contacts



***SURFACE TRANSPORTATION BOARD***  
***Washington, DC 20423***

*Office of Economics, Environmental Analysis and Administration*

August \_\_, 2008

Recipient (***Tribal Organization***)

***Contact Name, Title***

***Address 1***

***Address 2***

***City, State Zip Code***

Re: STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for  
Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Dear (***Contact Name***):

The purpose of this letter is initiate formal government-to-government consultation regarding the referenced project.

The Surface Transportation Board's (Board) previous letter of February 12, 2008 informed you of the proposed project and of our responsibility for preparing the appropriate National Environmental Policy Act (NEPA) documentation for railroad construction and operation cases that come before the Board, and for conducting government-to-government consultations with Federally recognized tribes under NEPA and other Federal laws.

The Board is interested in your views regarding the project's potential effects to Tribal lands, rights, resources, religious and cultural sites and subsistence activities. At your request, we can meet with you to hear your views and provide additional information regarding the Environmental Impact Statement process.

Your timely response will greatly assist us in incorporating your concerns into project development. For that purpose, we respectfully request that you complete the enclosed Project Consultation Options form and return it to us at your earliest convenience.

If you have any questions or would like to discuss the project please do not hesitate to contact Dave Navecky of my staff, at 202-245-0294 or Alan Summerville of ICF International, our independent third-party contractor, at 703-934-3616.

Sincerely,

Victoria Rutson  
Chief  
Section of Environmental Analysis

Enclosures:

ARRC Port MacKenzie Rail Extension Project Description  
Environmental Review Process Description  
Consultation Questionnaire

## CONSULTATION QUESTIONNAIRE

\_\_\_\_\_  
*(Tribal Organization)*

Project Name: Port MacKenzie Rail Extension Project Environmental Impact Statement

STB Finance Docket No. 35095, The Alaska Railroad Corporation – Petition for Exemption to Construct and Operate a Rail Line Extension to Port MacKenzie, Alaska

Please check the appropriate response(s) from the list below and use the back of this form or additional sheets if you wish to make comments:

\_\_\_\_\_ We have no interests associated with this proposed project and further consultation is not required.

\_\_\_\_\_ There are or may be issues of concern associated with this proposed project and we request further consultation. We prefer:

\_\_\_\_\_ Meeting with the Board and cooperating agencies at a tribal facility.

\_\_\_\_\_ Communication with the Board and cooperating agencies by scheduled teleconference.

\_\_\_\_\_ We want to continue to receive project information by mail and participate in the public involvement process.

Name of \_\_\_\_\_ *(Tribal Organization)* \_\_\_\_\_ designated contact for this proposed project:

\_\_\_\_\_  
Please print

Phone: \_\_\_\_\_

email: \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Please mail to:

David Navecky  
STB Finance Docket No. 35095  
Surface Transportation Board  
395 E Street, SW  
Washington, D.C. 20423-0001

## **PRELIMINARY LIST OF TRIBAL CONTACTS**

### **Tribal Governments**

Don Karabelnikoff, Tribal Administrator  
Native Village of Eklutna  
26339 Eklutna Village Road  
Chugiak, Alaska 99567

Jack Alcorn, Executive Director  
Knik Tribal Council  
PO Box 871565  
Wasilla, Alaska 99687-1565

Angela Sandstol, President  
Native Village of Tyonek  
PO Box 82009  
Tyonek, Alaska 99682-0009

Gary Harrison, Chief  
Chickaloon Village Traditional Council  
P.O. Box 1105  
Chickaloon, AK 99674-1105

### **Alaska Native Corporations**

Curtis McQueen, CEO  
Eklutna, Incorporated  
16515 Centerfield Dr., Suite 201  
Eagle River, AK 99577

Raymond Theodore, President  
Knikatnu, Incorporated  
P.O. Box 872130  
Wasilla, Alaska 99687-2130

Michaelene Stephan, President  
Tyonek Native Corporation  
1689 C St., Suite 219  
Anchorage, AK 99501-5131

Edith Baller, President  
Chickaloon-Moose Creek Native Association, Inc.  
P.O. Box 875046  
Wasilla, AK 99687

Margaret L. Brown  
President and Chief Executive Officer  
Cook Inlet Region, Inc.  
2525 C Street, Suite 500  
P.O. Box 93330  
Anchorage, Alaska 99509-3330

---

## **References**

Additional consultation reference materials include:

EO 13175, Consultation and Coordination with Indian Tribal Governments  
U.S. EPA, Region 10, Tribal Consultation Framework  
U.S. Department of Defense, American Indian and Alaska Native Policy  
U.S. Army Corps of Engineers, Alaska District Tribal Policy  
State of Alaska Administrative Order No. 186  
List of Federally Recognized Tribes (73 FR 66, April 4, 2008)

## **APPENDIX C**

### **WETLANDS**



## C. WETLANDS

The Surface Transportation Board (SEA) independently verified the wetland identification and classifications and found them to be acceptable for the purposes of this analysis. For purposes of the wetlands evaluation, the proposed Port MacKenzie Rail Extension project area is defined as the area within 500 feet on either side of the segments for a total width of 1,000 feet (HDR, 2008; HDR, 2010). The project area is about 20 percent wetlands. About one-fourth of the project area wetlands are forested, most of which are needleleaf forested wetlands, with broadleaf and mixed forested wetlands making up less than 1 percent of the project area. More than half the wetlands in the project area are scrub/shrub wetlands (59 percent), of which 42 percent are broadleaf scrub/shrub wetlands, 9 percent are needleleaf scrub/shrub wetlands, and 49 percent are mixed and other scrub/shrub wetlands. Emergent wetlands are less common in the project area, comprising about 11 percent. Five percent of the project area wetlands are classified as other waters, of which 23 percent are riverine waters and 32 percent are palustrine waters. This appendix describes the wetland classifications or the vegetation communities, soils, and hydrology patterns for wetlands in the project area; functional capacities identified for project area wetland classes; and wetlands within the 200-foot rail line right-of-way (ROW) of segments and associated facilities.

### C.1 Wetland Classifications

#### C.1.1 Forested Wetlands

Broadleaf forested wetlands are uncommon in the project area, occurring at only a single field point (Figure C-1). This wetland type is dominated by an overstory of paper birch (*Betula papyrifera*) and black spruce (*Picea mariana*) with a mixed understory of thin-leaf alder (*Alnus tenuifolia*), Greenland Labrador-tea (*Rhododendron groenlandicum*), and prickly rose (*Rosa acicularis*). Wetland hydrology indicators observed include water marks, saturation, and hydrogen sulfide odor within the soil profile. The soil at the site consists of a histosol (soils composed primarily of organic material).

Needleleaf evergreen forested wetlands are one of the most abundant wetland types mapped in the project area, occurring across broad flat areas and in low-lying depressions (Figure C-2). Plant community characteristics include an overstory dominated by black spruce (*Picea mariana*), with an understory of Greenland Labrador tea, mountain cranberry (*Vaccinium vitis-idaea*), field horsetail (*Equisetum arvense*), thin-leaf alder, black crowberry (*Empetrum nigrum*), narrow-leaf Labrador tea (*Rhododendron subarcticum* Harmaja), and tundra dwarf birch (*Betula glandulosa*). Most needleleaf forested wetlands are either on histosols or on mineral soils with histic epipedons. Some soil test pits exhibit a strong sulfidic odor, indicating anaerobic conditions, and all of these sites have saturated soils within the top 12 inches. Other wetland hydrology indicators include presence of a high water table, micro-topographic relief, stunted or stressed plants, and surface water.



**Figure C-1. Example of a Broadleaf Forested Wetland (left) and an Aerial Plan View of Broadleaf Forested Wetland (PF01, right) in the Project Area (HDR, 2008)**

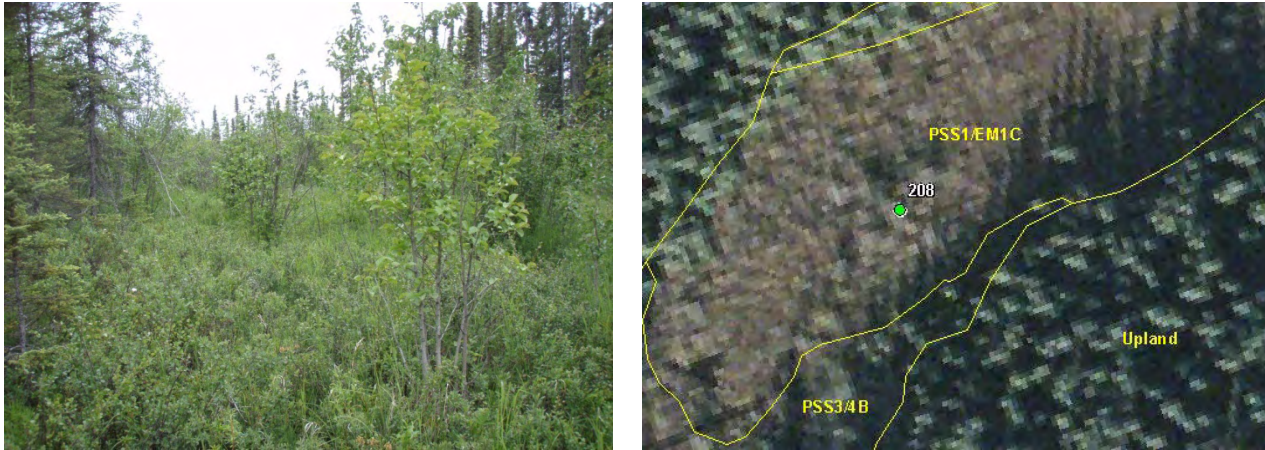


**Figure C-2. Example of a Needleleaf Forested Wetland (left) and an Aerial Plan View of Needleleaf Forested Wetland (PF04, right) in the Project Area (HDR, 2008)**

### **C.1.2 Scrub/Shrub Wetlands**

Broadleaf scrub/shrub wetlands are the most common wetland type in the project area, generally occurring across broad flat areas (Figure C-3). These wetlands are dominated by a canopy of swamp birch (*Betula nana*), sweetgale (*Myrica gale*), bluejoint reedgrass (*Calamagrostis canadensis*), water horsetail (*Equisetum fluviatile*), marsh cinquefoil (*Potentilla palustris*), water sedge (*Carex aquatilis*), and buckbean (*Menyanthes trifoliata*). Some areas appeared seasonally flooded or semi-permanently flooded and had a dense canopy dominated by thin-leaf alder.

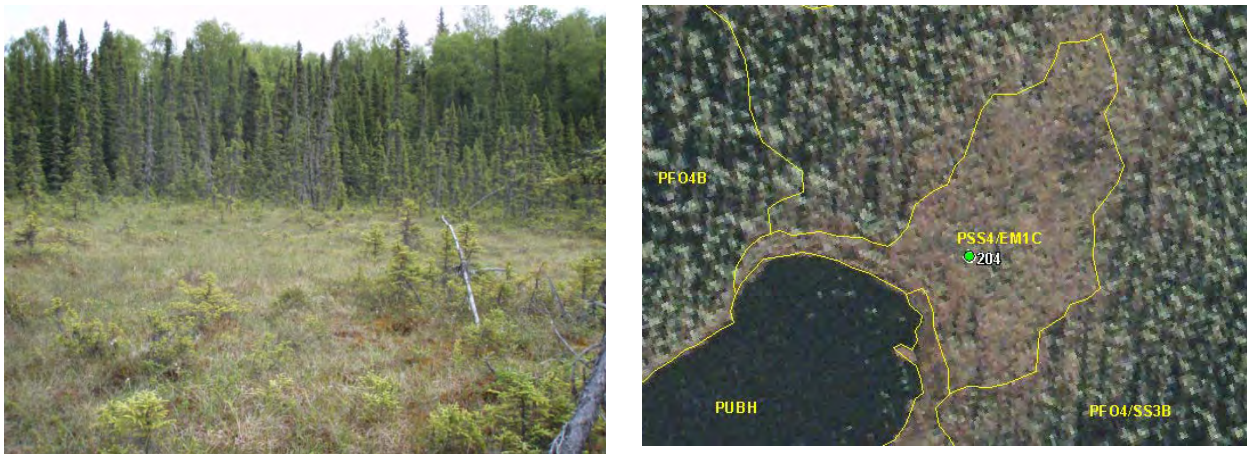




**Figure C-3. Example of a Bog-type Broadleaf Scrub/Shrub Wetland (left) and an Aerial Plan View of Bog-type Broadleaf Scrub/Shrub Wetland (PSS1, right) in the Project Area (HDR, 2008)**

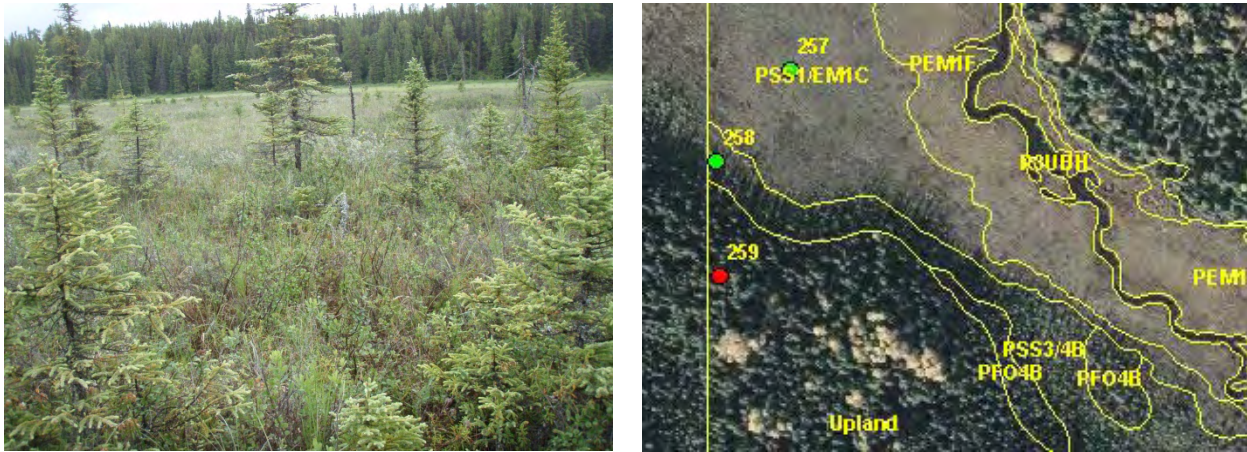
All the broadleaf scrub/shrub wetlands sampled had either histosols or histic epipedons. Common wetland hydrology indicators include saturated soils, a high water table, surface water, microtopographic relief, iron deposits, watermarks, reduced iron, stunted or stressed plants, and drainage patterns. Areas of inundation are easily seen on aerial photography at many locations.

Needleleaf scrub/shrub wetlands are common in the project area and generally occur on broad flat expanses (Figure C-4). This wetland type includes an open or closed canopy of shrub-height stunted black spruce (less than 20 feet tall), narrow-leaf Labrador tea, cloudberry (*Rubus chamaemorus*), Scheuchzer's cotton-grass (*Eriophorum scheuchzeri*), few-flower sedge (*Carex pauciflora*), and round-fruit sedge (*Carex rotundata*). All needleleaf scrub/shrub wetlands sampled had histosols, saturated soils, and a high water table.



**Figure C-4. Example of a Needleleaf Scrub/Shrub Wetland (left) and an Aerial Plan View of Needleleaf Scrub/Shrub Wetland (PSS4, right) in the Project Area (HDR, 2008)**

Mixed scrub/shrub wetlands are common in the project area and occur generally on large flat expanses (Figure C-5). Dominant plant species in this wetland type include stunted black spruce, narrow-leaf Labrador-tea, field horsetail, few-flower sedge, and water sedge. Histosols were encountered at all sites visited within this wetland type. Hydrogen sulfide odor, an indicator of anaerobic soil conditions, and saturated soils were observed at half of the sites sampled. Other commonly observed wetland hydrology indicators include a high water table, microtopographic relief, stunted or stressed plants, water marks, the presence of surface water, and iron deposits.

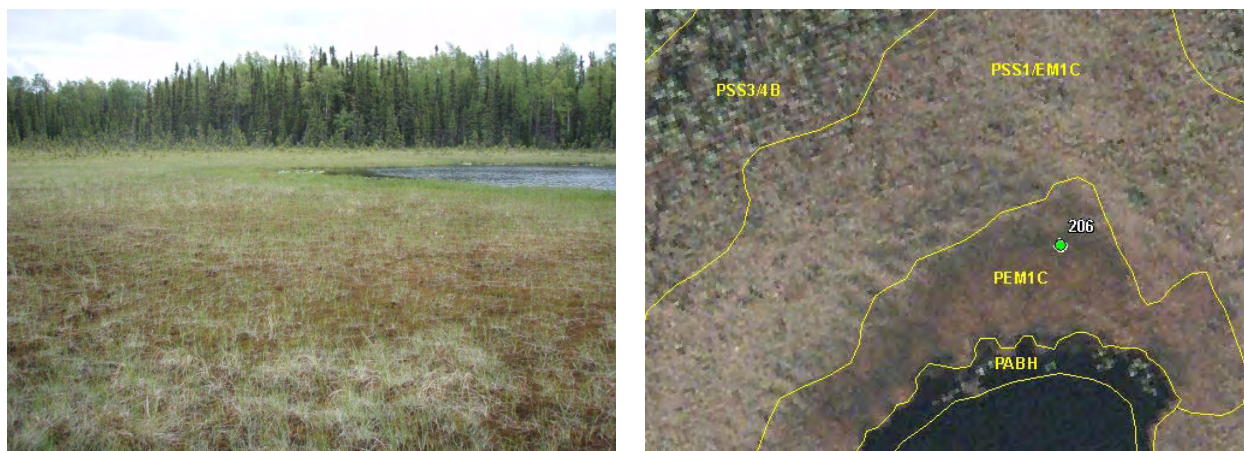


**Figure C-5. Example of a Mixed Broadleaf-Needleleaf Scrub/Shrub Wetland (left) and Aerial Plan View of Mixed Broadleaf-Needleleaf Scrub/Shrub Wetland (PSS1, right) in the Project Area (HDR, 2008)**

### C.1.3 Emergent Wetlands

Emergent wetlands are common throughout the project area and extend across broad, flat areas, low-lying depressions, and riverine corridors (Figure C-6). Most of these wetlands are dominated only by graminoids and forbs; however, some patterned bogs that contained higher mounds of shrubby vegetation were included in this wetland type when emergent vegetation dominated the wetland complex. Common plant species were creeping sedge (*Carex chordorrhiza*), water sedge, bluejoint reedgrass, livid sedge (*Carex livida*), bog cranberry (*Vaccinium oxycoccos*), and sweetgale. Histosols or histic epipedons are seen in most mapped emergent wetlands. Hydrogen sulfide odor, saturated soils, a high water table, and areas of surface water were also frequently observed. Drainage patterns and inundation are visible on aerial photography in many areas mapped as emergent wetlands. Extensive areas of patterned bog, characterized by a series of alternating low ridges and shallow inundated areas, are a dominant landscape feature across many of the larger emergent wetland complexes.





**Figure C-6. Example of an Emergent Wetland (left) and Aerial Plan View of Emergent Wetland (PEM1C, right) in the Project Area (HDR, 2008)**

### C.1.4 Other Wetlands and Waters

Other waters of the U.S. present in the project area include ponds, lakes, and streams (Figure C-7). Pond designation includes all open water habitats in the study area smaller than 20 acres (Cowardin *et al.*, 1979). Ponds with aquatic beds are generally shallower than unvegetated ponds and were also included in this category. Lakes designation includes all open water habitats in the study area larger than 20 acres (Cowardin *et al.*, 1979). There are five major streams in the project area – the Susitna River, the Little Susitna River, Willow Creek, Fish Creek, and an unnamed creek. Streams and their unvegetated floodplains were mapped in the project area (Figure C-7). Both intermittent streams and perennial streams were identified. Some perennial and all intermittent streams are mapped as linear features because they are too narrow to map effectively using polygonal regions.

## C.2 Wetland Functions and Values

Table C-1 lists the functional values of each vegetated wetland type within 500 feet of the proposed rail line. Functional capacities are evaluated on a scale of 0 to 1, with 0 equivalent to providing no function and 1 providing full function. The functional capacity values were calculated for a portion of the field sites, and extrapolated for the remaining wetlands. The values were grouped into categories based on their functional capacity value. Low includes functional capacity values 0.33 and lower, moderate includes functional capacity values above 0.33 and below 0.66, and high includes functional capacity values of 0.66 or higher. If a mapped wetland type did not have corresponding field data, the functional capacity was extrapolated from known functional capacity values. The eight functions for wetlands in the project area that would most likely be affected by proposed rail line construction and operations are:

- High functional capacity of all wetlands to modify groundwater discharge
- High functional capacity of permanently and semi-permanently flooded emergent wetlands to perform groundwater discharge



**Figure C-7. Examples of Pond Wetland (top left), Aerial Plan of Pond Wetland (PSS4, top right), Stream Wetland (above left), and Stream Wetland Distribution (R3UBH, above right) in the Project Area (HDR, 2008)**

- Moderate functional capacity of wetlands with an outlet to store storm and floodwaters
- Moderate functional capacity of wetlands with an outlet to modify stream flow
- High functional capacity of all wetlands to contribute to the abundance and diversity of wetland fauna
- High functional capacity of all wetlands to modify water quality
- High functional capacity of wetlands with an outlet to export detritus
- High functional capacity of all wetlands to contribute to the abundance and diversity of wetland vegetation

**Table C-1**  
**Average Functional Capacities for Project Area Wetlands by Hydrologic Regime<sup>a</sup> (page 1 of 2)**

Functional Capacity										
Hydrologic Regime	Hydrogeomorphic Class	Outlet	Area <sup>b</sup> (acres)	Export of Detritus	Groundwater Discharge	Groundwater Recharge	Streamflow Moderation	Contribution to Abundance and Diversity of Wetland Fauna	Storm Water and Floodwater Storage	Contribution to Abundance and Diversity of Wetland Vegetation
Saturated	Depression	No	44.4	Low	Moderate	Moderate	Low	High	High	High
		Yes	39.4	High	Moderate	Moderate	High	High	Moderate	High
	Flat	No	5.8	Low	Moderate	Moderate	Low	High	High	High
		Yes	1,767.6	High	High	Low	Moderate	High	Moderate	High
	Lacustrine Fringe	Yes	13.5	High <sup>c</sup>	Low <sup>c</sup>	Moderate <sup>c</sup>	Low <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>	High <sup>c</sup>
	Riverine	Yes	20.6	High	High	Moderate	High	High	High	High
	Slope	No	18.2	Low	Moderate	Low <sup>c</sup>	Low	High	High	High
		Yes	126.0	High <sup>c</sup>	High <sup>c</sup>	Low <sup>c</sup>	Moderate <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>	High <sup>c</sup>
Seasonally Flooded	Depression	No	26.2	Low	Moderate	Moderate	Low	Moderate	High	Moderate
		Yes	32.6	High	High	Moderate	Moderate	High	Moderate	High
	Flat	No	0.6	Low	Moderate	Moderate	Low	High	High	High
		Yes	572.4	High	High	Moderate	Moderate	High	Moderate	High
	Lacustrine Fringe	Yes	14.6	High	High	Moderate	Low <sup>c</sup>	Moderate	Moderate	High
	Riverine	Yes	128.3	High	Low <sup>c</sup>	Moderate	High	High	High	High
	Slope	No	4.7	Low	High <sup>c</sup>	Low <sup>c</sup>	Low	High	High	Moderate
		Yes	11.0	High <sup>c</sup>	Low <sup>c</sup>	Low <sup>c</sup>	Moderate <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>	High <sup>c</sup>

**Table C-1**  
**Average Functional Capacities for Project Area Wetlands by Hydrologic Regime<sup>a</sup> (page 2 of 2)**

Hydrologic Regime	Hydrogeomorphic Class	Outlet	Area <sup>b</sup> (acres)	Export of Detritus	Groundwater Discharge	Groundwater Recharge	Streamflow Moderation	Contribution to Abundance and Diversity of Wetland Fauna			Contribution to Abundance and Diversity of Wetland Vegetation		
								Storm Water and Floodwater Storage	Modification of Water Quality				
Semi-permanently Flooded	Depression	No	3.2	Low	High <sup>c</sup>	Moderate	Low	High	High		High	High	
		Yes	23.2	High <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>	Low	High <sup>c</sup>	Moderate <sup>c</sup>		High <sup>c</sup>	High <sup>c</sup>	
	Flat	Yes	57.9	High <sup>c</sup>	Moderate	Moderate <sup>c</sup>	Moderate <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>		High <sup>c</sup>	High <sup>c</sup>	
	Lacustrine Fringe	Yes	3.0	Moderate	High	Low	Low <sup>c</sup>	High	Moderate		High	High	
Temporarily Flooded	Riverine	Yes	27.4	High	High <sup>c</sup>	Moderate	High	High	Moderate		High	High	
	Riverine	Yes	5.0	High <sup>c</sup>	Moderate <sup>c</sup>	Moderate <sup>c</sup>	High <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>		High <sup>c</sup>	High <sup>c</sup>	
	Depression	Yes	11.3	High <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>	Low <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>		High <sup>c</sup>	High <sup>c</sup>	
	Flat	Yes	5.8	High <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>	Moderate <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>		High <sup>c</sup>	High <sup>c</sup>	
Permanently Flooded	Lacustrine Fringe	Yes	0.2	High <sup>c</sup>	High <sup>c</sup>	Low <sup>c</sup>	Low <sup>c</sup>	High <sup>c</sup>	Moderate <sup>c</sup>		High <sup>c</sup>	High <sup>c</sup>	
	Riverine	Yes	1.5	High	High	Moderate	High	High	Moderate		High	Moderate	
	N/A	Yes	0.3	Low <sup>c</sup>	Low <sup>c</sup>	Moderate <sup>c</sup>	Moderate <sup>c</sup>	Moderate <sup>c</sup>	Moderate <sup>c</sup>		High <sup>c</sup>	Moderate <sup>c</sup>	
		Yes	34.8	Low <sup>c</sup>	Low <sup>c</sup>	Moderate <sup>c</sup>	Moderate <sup>c</sup>	Moderate <sup>c</sup>	Moderate <sup>c</sup>		High <sup>c</sup>	Moderate <sup>c</sup>	
			<b>Total</b>	<b>2,999.5</b>									

<sup>a</sup> Sources: Magee and Hollands, 1998; HDR, 2008.

<sup>b</sup> Area within 500 feet of all segments, collectively. If the Surface Transportation Board authorized proposed rail line construction and operations, that authority would only extend to a subset of the segments. Therefore, the acreages listed do not represent a range or even maximum value of potential impacts to wetlands. Furthermore, the proposed right-of-way would be 200-feet wide and the wetland acreages listed are for a 1,000-foot wide project area defined for the purposes of wetland delineation.

<sup>c</sup> No data available; functional capacity was extrapolated.



### **C.3 Wetland Assessment Methodology**

From July 7 through 11, 2008, ARRC used the U.S. Army Corps of Engineers wetlands jurisdictional determination methodology to identify wetland types and areas within 500 feet of the segments (HDR, 2008). The U.S. Army Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual Alaska Region (USACE, 2007) provide the methodology for establishing wetland boundaries and types. The Corps of Engineers is reviewing and would have to approve the wetland boundaries and types described herein before initiating a wetland permit process for the project.

SEA used Geographic Information System analysis of delineated wetland areas within the 200-foot wide ROW to calculate the areal extent of wetlands the proposed rail line would directly affect. Tables C-2 and C-3 list the results of this analysis for the southern and northern segments by individual wetland class. Chapter 4, Section 4.5, summarizes wetland classification data by categories of needleleaf forested wetlands, broadleaf forested wetlands, mixed forested wetlands, broadleaf scrub/shrub wetlands, needleleaf scrub/shrub wetlands, mixed and other scrub/shrub wetlands, emergent wetlands, and other waters. SEA independently reviewed the wetland identification and classifications and found them to be acceptable for the purposes of this analysis.

**Table C-2**  
**Wetlands within 200-Foot Right-of-Way of the Southern Segment Combinations<sup>a</sup> (page 1 of 2)**

National Wetland Inventory Code	Description	Mac West-Connector 1			Mac West-Connector 2			Mac East-Connector 3		
		Area (acres)	Wetland Proportion (percent)		Area (acres)	Wetland Proportion (percent)		Area (acres)	Wetland Proportion (percent)	
PFO1/SS1B	Saturated broadleaved deciduous forest with broadleaf scrub/shrub understorey	25	8.9		25	10.5		23	22.2	23.3
PFO4/EM1B	Saturated broadleaved deciduous forest with persistent emergent understorey	0	0		0	0		1	1.4	1.5
PFO4/SS1B	Saturated needleleaf evergreen forest with broadleaf scrub/shrub understorey	2	0.6		2	0.7		7	6.6	6.9
PFO4/SS3B	Saturated needleleaf evergreen forest with broadleaved evergreen scrub/shrub understorey	25	9.0		25	10.7		19	18.5	18.9
PFO4/SS3C	Seasonally flooded needleleaf evergreen forest with broadleaved evergreen scrub/shrub understorey	4	1.6		4	1.9		3	2.4	2.5
PFO4/SS4B	Saturated needleleaf evergreen forest with needleleaf evergreen scrub/shrub understorey	2	0.9		2	0.7		5	4.7	5.0
PFO4B	Saturated needleleaf evergreen forest	60	21.5		52	22.1		13	12.3	12.0
PFO1/4B	Saturated broadleaved deciduous/needleleaf evergreen forest	2	0.5		2	0.6		3	3.3	3.5
PFO4/1B	Saturated needleleaf evergreen/broadleaved deciduous forest	7	2.6		7	3.1		0	0	0
PSS1/EM1B	Saturated broadleaf deciduous scrub/shrub with persistent emergent understorey	6	2.1		5	2.2		2	2.3	2.4
PSS1/EM1C	Seasonally flooded broadleaf deciduous scrub/shrub with persistent emergent understorey	8	2.9		6	2.6		2	1.6	1.4
PSS1/EM1F	Semipermanently flooded broadleaf deciduous scrub/shrub with persistent emergent understorey	9	3.4		10	4.0		1	1.0	1.1
PSS1B	Saturated broadleaf deciduous scrub/shrub	<1 <sup>b</sup>	0.0		<1	0.0		<1	0.2	0.2
PSS1C	Seasonally flooded broadleaf deciduous scrub/shrub	1	0.4		1	0.5		2	1.5	0
PSS4/EM1B	Saturated needleleaved evergreen with persistent emergent understorey	2	0.7		<1	0.2		0	0	0
PSS4/EM1C	Seasonally flooded needleleaved evergreen with persistent emergent understorey	1	0.2		<1	0.1		0	0	0
PSS4B	Saturated needleleaved evergreen scrub/shrub	6	2.2		5	2.1		1	1.2	1.3

**Table C-2**  
**Wetlands Within 200-Foot Right-of-Way of the Southern Segment Combinations<sup>a</sup> (page 2 of 2)**

National Wetland Inventory Code	Description	Mac West-Connector 1			Mac West-Connector 2			Mac East-Connector 3			Mac East		
		Area (acres)	Wetland Proportion (percent)		Area (acres)	Wetland Proportion (percent)		Area (acres)	Wetland Proportion (percent)		Area (acres)	Wetland Proportion (percent)	
PSS1/3B	Saturated broadleaved deciduous/broadleaved evergreen scrub/shrub	0	0		0	0		<1	0.0		<1	0.0	
PSS1/4B	Saturated broadleaved deciduous/needleleaved evergreen scrub/shrub	14	4.9		14	5.8		6	5.8		6	5.8	
PSS1/4C	Seasonally flooded broadleaved deciduous/needleleaved evergreen scrub/shrub	0	0		0	0		2	1.9		2	2.0	
PSS3/1B	Saturated broadleaved evergreen/broadleaved deciduous scrub/shrub	12	4.2		3	1.3		<1	0.0		<1	0.0	
PSS3/1C	Seasonally flooded broadleaved evergreen/broadleaved deciduous scrub/shrub	<1	0.2		1	0.2		0	0		0	0	
PSS3/4B	Saturated broadleaved evergreen/needleleaved evergreen scrub/shrub	47	16.7		39	16.6		11	11.0		10	10.7	
PSS4/1B	Saturated needleleaved evergreen/broadleaved deciduous scrub/shrub	8	3.1		8	3.4		1	0.8		1	0.9	
PSS4/3B	Saturated needleleaved evergreen/broadleaved evergreen scrub/shrub	15	5.3		8	3.6		0	0		0	0	
PEM1B	Saturated persistent emergent	9	3.2		8	3.5		0	0		0	0	
PEM1C	Seasonally flooded persistent emergent	5	1.6		2	1.0		1	0.7		<1	0.1	
PEM1F	Semi-permanently flooded persistent emergent	8	2.9		6	2.3		<1	0.4		1	0.4	
L2UBH	Permanently flooded unconsolidated bottom littoral	1	0.2		1	0.2		0	0		0	0	
PABH	Aquatic bed pond	<1	0.0		0	0		0	0		0	0	
PUBH	Pond	<1	0.1		0	0		0	0		0	0	
R3UBH	Upper perennial stream – unconsolidated bottom	<1	0.1		0	0		<1	0.1		<1	0.1	
Wetland <sup>c</sup>		279			236			103			98		
Upland		327			347			489			371		

<sup>a</sup> Source: HDR, 2008; HDR, 2010.

<sup>b</sup> < = less than.

<sup>c</sup> Totals might not equal sums of values due to rounding.

**Table C-3**  
**Wetlands within 200-Foot Right-of-Way of the Northern Segments and Segment Combinations<sup>a</sup> (page 1 of 2)**

National Wetland Inventory Code	Description	Willow			Big Lake			Houston-Houston North			Houston-Houston South		
		Area (acres)	Wetland Proportion (percent)	Area (acres)	Area (acres)	Wetland Proportion (percent)	Area (acres)	Area (acres)	Wetland Proportion (percent)	Area (acres)	Area (acres)	Wetland Proportion (percent)	Area (acres)
PFO4/EM1B	Saturated needleleaf evergreen forest with persistent emergent understory	1	1.0	0	0	0	0	0	0	0	0	0	0
PFO4/SS1B	Saturated needleleaf evergreen forest with broadleaf deciduous scrub/shrub understory	2	1.9	1	1	0.4	6	3.3	<1	0.0			
PFO4/SS1C	Seasonally flooded needleleaf evergreen forest with broadleaf deciduous scrub/shrub understory	<1	0.2	0	0	0	0	0	0	0	0	0	0
PFO4/SS3B	Saturated needleleaf evergreen forest with broadleaf evergreen scrub/shrub understory	4	4.4	2	2	2.2	6	2.9	3	1.9			
PFO4/SS4B	Saturated needleleaf evergreen forest with needleleaf evergreen scrub/shrub understory	3	3.8	5	5	4.7	11	5.6	11	7.5			
PFO4B	Saturated needleleaf evergreen forest	11	12.9	8	8	6.9	19	9.3	12	8.4			
PSS1/EM1B	Saturated broadleaf deciduous scrub/shrub with persistent emergent understory	13	15.1	2	2	2.1	18	8.9	4	2.6			
PSS1/EM1C	Seasonally flooded broadleaf deciduous scrub/shrub with persistent emergent understory	17	19.8	30	30	27.1	30	14.9	22	15.4			
PSS1/EM1F	Semi-permanently flooded broadleaf deciduous scrub/shrub with persistent emergent understory	0	0	0	0	0	<1	0.3	1	0.4			
PSS1A	Temporarily flooded broadleaf deciduous scrub/shrub	1	1.0	0	0	0	0	0	0	0			
PSS1B	Saturated broadleaf deciduous scrub/shrub	2	2.7	7	7	6.1	0	0	2	1.7			
PSS1C	Seasonally flooded broadleaf deciduous scrub/shrub	2	2.6	5	5	4.0	1	0.6	1	0.5			
PSS4/EM1B	Saturated needleleaf evergreen scrub/shrub with persistent emergent understory	2	1.8	8	8	7.7	5	2.5	3	2.4			
PSS4/EM1C	Seasonally flooded needleleaf evergreen scrub/shrub with persistent emergent understory	<1	0.0	2	2	1.5	1	0.5	1	0.7			
PSS4B	Saturated needleleaf evergreen scrub/shrub	<1	0.5	4	4	3.5	3	1.3	3	1.9			
PSS3/1B	Saturated broadleaf evergreen/broad-leaved deciduous scrub/shrub	1	0.8	3	3	3.0	3	1.4	10	6.9			
PSS3/4B	Saturated broadleaf evergreen/needleleaf evergreen scrub/shrub	4	5.3	4	4	3.2	32	16.0	28	19.2			

**Table C-3**  
**Wetlands within 200-Foot Right-of-Way of the Northern Segments and Segment Combinations<sup>a</sup> (page 2 of 2)**

National Wetland Inventory Code	Description	Willow		Big Lake		Houston-Houston North		Houston-Houston South	
		Area (acre)	Wetland Proportion (percent)	Area (acre)	Wetland Proportion (percent)	Area (acre)	Wetland Proportion (percent)	Area (acre)	Wetland Proportion (percent)
PSS3/4C	Seasonally flooded broadleaved evergreen/needleleaved evergreen scrub/shrub	<1	0.5	0	0	<1	0.0	<1	0.0
PSS3/EM1B	Saturated broadleaved evergreen with persistent emergent understory	0	0	0	0	<1	0.1	<1	0.2
PSS1/3B	Saturated broadleaved deciduous/broadleaved evergreen scrub/shrub	3	3.6	0	0	<1	0.3	<1	0.4
PSS1/3C	Seasonally flooded broadleaved deciduous/broadleaved evergreen scrub/shrub	0	0	2	1.5	0	0	0	0
PSS1/4B	Saturated broadleaved deciduous/needleleaved evergreen scrub/shrub	1	0.8	<1	0.0	5	2.6	1	0.5
PSS4/1B	Saturated needleleaved evergreen/broadleaved deciduous scrub/shrub	2	2.0	13	11.6	3	1.5	0	0
PSS4/1C	Seasonally flooded needleleaved evergreen/broadleaved deciduous scrub/shrub	0	0	<1	0.3	0	0	0	0
PSS4/3B	Saturated needleleaved evergreen/broadleaved evergreen scrub/shrub	2	2.0	7	6.7	22	11.1	20	13.8
PEM1B	Saturated persistent emergent	3	3.8	1	1.1	2	1.1	1	0.9
PEM1C	Seasonally flooded persistent emergent	6	7.6	6	5.4	15	7.7	11	7.4
PEM1F	Semi-permanently flooded persistent emergent	2	2.4	<1	0.3	12	5.7	8	5.3
L2UBH	Permanently flooded unconsolidated bottom littoral	0	0	<1	0.3	0	0	0	0
PABH	Aquatic bed pond	<1	0.0	0	0	2	1.3	1	0.5
PUBH	Pond	1	0.9	0	0	1	0.6	1	1.1
R3ABH	Upper perennial stream – aquatic bed	<1	0.3	0	0	0	0	0	0
R3UBH	Upper perennial stream – unconsolidated bottom	2	2.0	1	0.4	1	0.4	1	0.5
R3USC/R3USA	Seasonally/temporarily flooded upper perennial stream – unconsolidated shore	<1	0.3	0	0	0	0	0	0
Wetland		85		111		198		145	
Upland		630		410		250		316	

<sup>a</sup> Source: HDR, 2008; HDR, 2010.

<sup>b</sup> < = less than.

<sup>c</sup> Totals might not equal sums of values due to rounding.

## **C.4 References**

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## **APPENDIX D**

### **VEGETATION RESOURCES**

## D. VEGETATION RESOURCES

This appendix provides additional detail on existing conditions for vegetation in the Port MacKenzie Rail Extension study area. This information is based on Nowacki *et al.* (2001), Gallant *et al.* (1995), Viereck *et al.* (1992), and ANHP *et al.* (2008). The study area is defined as vegetation cover within 5 miles of the centerline (10 mile total width) of the proposed rail line segments (Table D-1). Within the study area is the 200-foot right-of-way (ROW) of the rail line segments. SEA's quantification of vegetation and habitat types in the study area is based on the U.S. Geological Survey National Land Cover Database (Homer *et al.*, 2004). Table D-2 lists vegetation communities by landscape positions and vegetation type. Table D-3 lists vegetation cover within the 200-foot right-of-way of the southern segment combinations, and Table D-4 lists vegetation cover within the 200-foot right-of-way of the northern segment combinations.

Table D-1 Vegetation Cover Classes within the Study Area of the Proposed Port MacKenzie Rail Extension <sup>a</sup>		
Class Name	Area (acres)	Percent of Area
Barren Land	4,448	Less than 1
Cultivated Crops	11,810	2
Deciduous Forest Closed	81,855	16
Deciduous Forest Open	9,312	2
Deciduous Forest Woodland	2,282	Less than 1
Developed, High Intensity	959	Less than 1
Developed, Low Intensity	7,393	1
Developed, Medium Intensity	1,814	Less than 1
Developed, Open Space	5,630	1
Emergent Herbaceous Wetlands	70,426	14
Evergreen Forest Closed	64,438	13
Evergreen Forest Open	1,298	Less than 1
Evergreen Forest Woodland	604	Less than 1
Mixed Forest Closed	90,911	18
Mixed Forest Open	4,545	Less than 1
Mixed Forest Woodland	1,868	Less than 1
Open Water	57,551	11
Pasture/Hay	382	Less than 1
Shrub/Scrub	13,580	3
Woody Wetlands	82,584	16
<b>Total</b>	<b>513,690</b>	
<sup>a</sup> Source: Homer <i>et al.</i> , 2004.		



**Table D-2**  
**Vegetation Communities<sup>a</sup> for the National Land Cover Database Land Cover Classifications<sup>b</sup>**  
 (page 1 of 3)

Classification	Landscape Position	Vegetation Type	Common Plants
Evergreen Forest Closed (canopy 60 to 100 percent)	Well-drained hillsides or young river terraces	Closed white spruce forest	White spruce ( <i>Picea glauca</i> ), willows ( <i>Salix</i> spp.), prickly rose ( <i>Rosa acicularis</i> ), lowbush cranberry ( <i>Vaccinium vitis-idaea</i> ), bluebell ( <i>Mertensia paniculata</i> ), woodland horsetail ( <i>Equisetum sylvaticum</i> ), Canada dogwood ( <i>Cornus canadensis</i> ), feathermoss ( <i>Hylocomium splendens</i> )
	Poorly drained silts on floodplain terraces or north-facing slopes	Closed black spruce forest	Black spruce ( <i>Picea mariana</i> ), green alder ( <i>Alnus crispa</i> ), Labrador tea ( <i>Rhododendron groenlandica</i> ), lowbush cranberry, polar grass ( <i>Arctagrostis latifolia</i> ), feathermoss
	Poorly drained silts on floodplain terraces	Closed black spruce-white spruce forest	Black spruce, white spruce, green alder, Labrador tea, lowbush cranberry, feathermoss
Evergreen Forest Open (canopy 25 to 60 percent)	Well-drained hillsides or young river terraces	Open white spruce forest	White spruce, Bebb's willow ( <i>Salix bebbiana</i> ), Canada dogwood, highbush cranberry ( <i>Viburnum edule</i> ), prickly rose, twinflower ( <i>Linnaea borealis</i> ), feathermosses ( <i>Hylocomium splendens</i> , <i>Rhytidiadelphus loreus</i> and others), common horsetail ( <i>Equisetum arvense</i> )
	Poorly drained silts on floodplain terraces or broad, flat areas within low-lying depressions	Open black spruce forest	Black spruce, prickly rose, willows ( <i>Salix</i> spp.), green alder, Labrador tea, lowbush cranberry, crowberry ( <i>Empetrum nigrum</i> ), grasses, feathermosses, Sphagnum mosses ( <i>Sphagnum</i> spp.), tundra dwarf birch ( <i>Betula glandulosa</i> )
Evergreen Forest Woodland (canopy 10 to 25 percent)	Well drained sites with thin soils, most common near tree line	White spruce woodland	White spruce, tundra dwarf birch, lowbush cranberry, crowberry, feathermoss and fruticose lichens ( <i>Cladonia</i> spp.),
	Cold, wet, poorly drained soils on floodplains and slopes	Black spruce woodland	Black spruce, green alder, tundra dwarf birch, various willows, lowbush cranberry, Labrador tea, bog blueberry ( <i>Vaccinium uliginosum</i> )
	Cold sites with poorly developed, stony soils over bedrock	Black spruce-white spruce woodland	Black spruce, white spruce, tundra dwarf birch, green alder, bog blueberry, lowbush cranberry, crowberry, Labrador tea, bluejoint reedgrass ( <i>Calamagrostis canadensis</i> ), feathermosses, fruticose lichens
Deciduous Forest Closed (canopy 60 to 100 percent)	Floodplain terraces	Closed balsam poplar forest	Balsam poplar ( <i>Populus balsamifera</i> ), white spruce, prickly rose, bluejoint reedgrass, common horsetail
	Upland loess soils	Closed paper birch forest	Paper birch ( <i>Betula papyrifera</i> ), green alder, prickly rose, highbush cranberry, Canada dogwood, common horsetail, bluejoint reedgrass, Labrador tea, lowbush cranberry
	Well-drained slopes, upland slopes, south-facing	Closed quaking aspen forest	Quaking aspen ( <i>Populus tremuloides</i> ), prickly rose, twinflower, soapberry ( <i>Shepherdia canadensis</i> ), bearberry ( <i>Arctostaphylos uva-ursi</i> )

**Table D-2**  
**Vegetation Communities<sup>a</sup> for the National Land Cover Database Land Cover Classifications<sup>b</sup>**  
 (page 2 of 3)

Classification	Landscape Position	Vegetation Type	Common Plants
Deciduous Forest Closed (canopy 60 to 100 percent) (continued)	Well-drained slopes	Closed paper birch-quaking aspen forest	Paper birch, quaking aspen, white spruce, green alder, prickly rose, soapberry, lowbush cranberry, grasses, clubmosses ( <i>Lycopodium</i> spp.)
	Well-drained slopes, floodplain terraces	Closed quaking aspen-balsam poplar forest	Quaking aspen, balsam poplar, prickly rose
Deciduous Forest Open (canopy 25 to 60 percent)	Upland loess soils	Open paper birch forest	Paper birch, green alder, Labrador tea, bluejoint reedgrass, leaf litter
	Well-drained slopes, upland slopes, commonly south-facing	Open quaking aspen forest	Quaking aspen, willows, bearberry, fireweed ( <i>Epilobium</i> spp.), bluejoint reedgrass, lichens
	Floodplain terraces	Open balsam poplar forest	Balsam poplar, willows, alder, bluejoint reedgrass, horsetail ( <i>Equisetum</i> spp.)
Deciduous Forest Woodland (canopy 10 to 25 percent)	Floodplains and slopes near tree line	Balsam poplar woodland	Balsam poplar, green alder, various willows, prickly rose, high bush cranberry, bluejoint reedgrass
	Well-drained sites, with alluvium originated soils	Paper birch-balsam poplar woodland	Paper birch, balsam poplar
Mixed Forest Closed (canopy 60 to 100 percent)	Well-drained slopes, poorly drained slopes, floodplain terraces	Closed spruce-paper birch forest	White spruce, paper birch, green alder, Bebb's willow, prickly rose, bluejoint reedgrass, common horsetail, lowbush cranberry, feathermosses
	Well-drained slopes, upland slopes	Closed quaking aspen-spruce forest	Quaking aspen, white spruce, Canada dogwood
	Floodplain terraces	Closed balsam poplar-white spruce	Balsam poplar, white spruce, thinleaf alder ( <i>Alnus tenuifolia</i> ), prickly rose, lowbush cranberry, common horsetail
Mixed Forest Open (canopy 25 to 60 percent)	Relatively wet, poorly drained upland sites	Open spruce-paper birch forest	Paper birch, white or black spruce, green alder, various willow, bluejoint reedgrass, tundra dwarf birch, spiraea ( <i>Spiraea beauverdiana</i> ), bog blueberry, lowbush cranberry, narrow leaf Labrador tea ( <i>Rhododendron subarcticum</i> Harmaja), feathermosses
	Creek bottoms	Open paper birch-balsam poplar-spruce forest	White spruce, paper birch, cotton wood, alder, willow, bog blueberry, lowbush cranberry, Canada dogwood, crowberry, spiraea, prickly rose, Labrador tea, bluejoint reedgrass, fireweed, bluebell
	Slopes at tree line	Open spruce-balsam poplar forest	White spruce, balsam poplar, alder, willow, highbush cranberry, prickly rose, devil's club ( <i>Oplopanax horridus</i> ), fireweed, Canada dogwood, bluebell, horsetail, various ferns
Mixed Forest Woodland (canopy 10 to 25 percent)	Creek bottoms	Spruce-paper birch woodland	Paper birch, black spruce or white spruce,

**Table D-2**  
**Vegetation Communities<sup>a</sup> for the National Land Cover Database Land Cover Classifications<sup>b</sup>**  
 (page 3 of 3)

Classification	Landscape Position	Vegetation Type	Common Plants
Shrub/Scrub (less than 5 meters tall, canopy less than 20 percent)	Active and young floodplains, river bars, and after fires	Tall willow scrub	Alaska willow ( <i>Salix alaxensis</i> ), sandbar willow ( <i>Salix interior</i> ), grayleaf willow ( <i>Salix glauca</i> ), Bebb's willow, littletree willow ( <i>Salix arbusculoides</i> ), bluejoint, fireweed, horsetail
	Along rivers and after fires, Upland drainageways, seepages	Tall alder scrub	Thinleaf alder, green alder, bluejoint reedgrass
	Active and young floodplains, river bars	Tall alder-willow scrub	Thinleaf alder, green alder, Alaska willow, Bebb's willow, common horsetail, in wet areas with water sedge ( <i>Carex aquatilis</i> ), bluejoint, marsh fivefinger ( <i>Potentilla palustris</i> ), swamp horsetail ( <i>Equisetum fluviatile</i> )
Woody Wetlands (canopy less than 20 percent under saturated conditions)	Non-patterned wetlands with thick organic mat	Low mixed shrub-sedge tussock bog	Resin birch ( <i>Betula glandulosa</i> ), willows, tussock forming cottongrasses ( <i>Eriophorum brachyantherum</i> or <i>Eriophorum vaginatum</i> ), bog blueberry, narrow leaf Labrador tea, Sphagnum mosses
		Shrub birch-ericaceous shrub bog	Resin birch ( <i>Betula glandulosa</i> ), dwarf ericaceous-like shrubs ( <i>Vaccinium uliginosum</i> , <i>Vaccinium vitis-idaea</i> or <i>Rubus chamaemorus</i> ), mosses ( <i>Sphagnum</i> spp.), bog-rosemary ( <i>Andromeda polifolia</i> , Lapland rosebay ( <i>Rhododendron lapponicum</i> ), sedges ( <i>Carex</i> spp), sweet gale, ( <i>Myrica gale</i> ), bush cinquefoil ( <i>Potentilla fruticosa</i> ), black crowberry ( <i>Empetrum nigrum</i> ), dwarf labrador tea ( <i>Ledum decumbens</i> ), feathermosses
		Ericaceous scrub bog	Leatherleaf ( <i>Chamaedaphne calyculata</i> ), willows, water sedge ( <i>Carex</i> spp.)
		Shrub birch-willow scrub	Resin birch, diamondleaf willow ( <i>Salix pulchra</i> ), grayleaf willow
		Low scrub	Labrador tea, bog blueberry, willows, feathermosses
	Lake and pond margins, sloughs, silty or organic soils	Subarctic lowland sedge wet meadow	Water sedge, narrow-leaf cottongrass ( <i>Eriophorum angustifolium</i> ), marsh fivefinger, swamp horsetail
	Sloughs, oxbow lakes, lake margins, silty or organic soils, fens	Fresh herb marsh	Buckbean ( <i>Menyanthes trifoliata</i> ), swamp horsetail, water smartweed ( <i>Polygonum amphibium</i> )
	Poorly drained silty lowlands to well-drained upland slopes	Bluejoint meadow	Bluejoint reedgrass ( <i>Calamagrostis canadensis</i> ), sedge ( <i>Carex rostrata</i> ), cinquefoil ( <i>Potentilla</i> spp.), fireweed
	Shallow Lakes and ponds	Aquatic bed	Yellow pondlily ( <i>Nuphar polysepalum</i> ), pondweed ( <i>Potamogeton</i> spp.), water milfoil ( <i>Myriophyllum spicatum</i> )
Barren Land	River bars (dry to mesic)	Seral herbs	Yellow dryas ( <i>Dryas drummondii</i> ), river beauty ( <i>Epilobium latifolium</i> ), fireweed

<sup>a</sup> Sources: Viereck *et al.*, 1992; HDR, 2008.

<sup>b</sup> Source: Homer *et al.*, 2004.

**Table D-3**  
**Vegetation Cover within the 200-Foot Right-of-Way of the Southern Segment Combinations<sup>a</sup>**

<b>Vegetation Class</b>	<b>Mac West-Connector 1</b>		<b>Mac West-Connector 2</b>		<b>Mac East-Connector 3</b>		<b>Mac East</b>	
	<b>Area (acres)<sup>b,c</sup></b>	<b>ROW Area (percent)<sup>c</sup></b>	<b>Area (acres)<sup>b,c</sup></b>	<b>ROW Area (percent)<sup>c</sup></b>	<b>Area (acres)<sup>b,c</sup></b>	<b>ROW Area (percent)<sup>c</sup></b>	<b>Area (acres)<sup>b,c</sup></b>	<b>ROW Area (percent)<sup>c</sup></b>
Barren Land	0	0.0	0	0.0	0	0.0	0	0.0
Cultivated Crops	64	10.5	93	16.0	4	0.7	<1	0.1
Deciduous Forest Closed	37	6.1	36	6.2	133	22.5	121	25.8
Deciduous Forest Open	4	0.6	4	0.6	9	1.6	9	1.9
Deciduous Forest Woodland	10	1.7	10	1.7	13	2.2	13	2.7
Developed, High Intensity	0	0.0	0	0.0	0	0.0	0	0.0
Developed, Low Intensity	1	0.1	1	0.1	2	0.3	<1	0.0
Developed, Medium Intensity	0	0.0	0	0.0	0	0.0	0	0.0
Developed, Open Space	1	0.1	1	0.2	<1	0.1	<1	0.1
Emergent Herbaceous Wetlands	40	6.6	37	6.3	21	3.5	13	2.8
Evergreen Forest Closed	109	18.0	88	15.1	86	14.6	47	10.0
Evergreen Forest Open	1	0.1	1	0.1	0	0.0	0	0.0
Evergreen Forest Woodland	2	0.3	2	0.3	<1	0.1	<1	0.0
Mixed Forest Closed	162	26.7	158	27.0	235	39.6	186	39.6
Mixed Forest Open	3	0.5	3	0.5	9	1.4	8	1.8
Mixed Forest Woodland	5	0.9	5	0.9	6	1.0	6	1.3
Open Water	<1	0.0	<1	0.0	0	0.0	0	0.0
Pasture/Hay	0	0.0	0	0.0	<1	0.1	<1	0.1
Shrub/Scrub	11	1.8	11	1.9	33	5.6	31	6.5
Woody Wetlands	158	26.0	134	23.0	40	6.8	34	7.2
<b>Total Area</b>	<b>608</b>	<b>100.00</b>	<b>584</b>	<b>100.0</b>	<b>592</b>	<b>100.0</b>	<b>469</b>	<b>100.0</b>

<sup>a</sup> Source: Homer *et al.*, 2004.<sup>b</sup> < = less than.<sup>c</sup> Totals might not equal sums of values due to rounding.

**Table D-4**  
**Vegetation Cover within the 200-Foot Right-of-Way of the Northern Segments and**  
**Segment Combinations<sup>a</sup>**

Vegetation Class	Willow		Big Lake		Houston-Houston North		Houston-Houston South	
	Area (acres) <sup>b,c</sup>	ROW Area (percent) <sup>c</sup>	Area (acres) <sup>b,c</sup>	ROW Area (percent) <sup>c</sup>	Area (acres) <sup>b,c</sup>	ROW Area (percent) <sup>c</sup>	Area (acres) <sup>b,c</sup>	ROW Area (percent) <sup>c</sup>
Barren Land	0	0.0	0	0.0	0	0.0	0	0.0
Cultivated Crops	2	0.3	<1	0.1	0	0.0	0	0.0
Deciduous Forest Closed	228	32.0	114	21.8	79	17.6	55	12.0
Deciduous Forest Open	20	2.9	15	2.9	11	2.5	3	0.6
Deciduous Forest Woodland	5	0.7	3	0.5	5	1.2	1	0.2
Developed, High Intensity	0	0.0	0	0.0	0	0.0	0	0.0
Developed, Low Intensity	1	0.1	16	3.0	<1	0.1	3	0.6
Developed, Medium Intensity	0	0.0	0	0.0	0	0.0	0	0.0
Developed, Open Space	31	4.3	31	5.9	<1	0.1	17	3.8
Emergent Herbaceous Wetlands	25	3.5	57	10.9	81	18.2	146	31.7
Evergreen Forest Closed	89	12.5	43	8.2	82	18.4	65	14.1
Evergreen Forest Open	<1	0.0	2	0.4	1	0.3	1	0.3
Evergreen Forest Woodland	<1	0.0	<1	0.1	1	0.3	1	0.3
Mixed Forest Closed	270	37.8	115	22.1	68	15.1	47	10.3
Mixed Forest Open	7	1.0	5	1.0	5	1.2	3	0.6
Mixed Forest Woodland	4	0.6	3	0.5	2	0.4	1	0.1
Open Water	<1	0.0	<1	0.1	<1	0.1	<1	0.1
Pasture/Hay	0	0.0	0	0.0	0	0.0	0	0.0
Shrub/Scrub	4	0.6	41	7.8	1	0.1	27	5.9
Woody Wetlands	27	3.8	77	14.7	109	24.4	90	19.5
<b>Total Area</b>	<b>715</b>	<b>100.0</b>	<b>521</b>	<b>100.0</b>	<b>448</b>	<b>100.0</b>	<b>461</b>	<b>100.0</b>

<sup>a</sup> Source: Homer *et al.*, 2004.

<sup>b</sup> < = less than.

<sup>c</sup> Totals might not equal sums of values due to rounding.

There are no known Federal- or state-protected threatened, endangered, or candidate plant species in the study area (Lipkin, 2008; HDR, 2008). Preliminary research by the Applicant (HDR, 2008) did not indicate the presence of rare plants, although one data sheet from wetland delineations conducted during the summer of 2008 shows a record for brownish sedge (*Carex brunnescens*), which is closely related to a rarer subspecies, Alaska brownish sedge (*Carex brunnescens ssp. Alaskana*). There is some possibility that this plant was misidentified, but this cannot be confirmed with existing data. Rare-plant surveys have not been completed for the entire Port MacKenzie Rail Extension study area and existing data do not represent a comprehensive accounting of rare plants across all segments.

## **D.1 Noxious Weeds**

The State of Alaska regulates prohibited and restricted noxious weeds. The U.S. Department of Agriculture, Animal and Plant Health Inspection Service, regulates designated noxious weeds. There are no known federally designated noxious weeds in Alaska. Noxious weeds are generally introduced through contaminated seed sources, equipment, vehicles, materials, and supplies used in revegetation. They are typically spread by construction vehicles, water, and wind. Noxious weeds could also be introduced to the Port MacKenzie Rail Extension study area through spills of contaminated grain or animal feeds (hay, pellets) during proposed rail line operations. The growth of invasive plant populations is typically encouraged by natural or man-made disturbances.

The State of Alaska regulates the spread of invasive weed species and has listed 12 species as prohibited noxious weeds and 9 species as restricted noxious weeds under Title 11 of Alaska state statutes (11 ACC 34.020). Prohibited noxious weeds are any species of plants which when established is or may become destructive and difficult to control by ordinary means of cultivation or other farm practices. Restricted noxious weeds are species of plants which are very objectionable in fields, lawns, and gardens, but which can be controlled by good cultural practices. Four prohibited weeds and five restricted weeds have been reported in the study area (ANHP *et al.*, 2008; Lipkin, 2008). Table 5.2-2 in Chapter 5 of this Environmental Impact Statement lists regulated weed species. There are a number of non-native invasive plants in Alaska<sup>1</sup> that are not regulated by the State of Alaska. Table D-5 lists all invasive plant populations that have been documented in the study area. Comprehensive surveys for invasive plants have not been completed for all segments. The data provided are from surveys compiled by various state and Federal entities for transportation corridors and municipalities (ANHP *et al.*, 2008). The highest concentrations of invasive plants in the study area are found in the more highly disturbed areas adjacent to Parks Highway and Knik-Goose Bay Road and in agricultural areas near Port MacKenzie. Segments near these areas would be more likely to contribute to the spread of invasive plants.

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<sup>1</sup> The non-native invasive plant list in Alaska is compiled by the Alaska Exotic Plant Information Clearing (AKEPIC), which is cooperative project among the U.S. Forest Service, National Park Service, Agricultural Research Service, U.S. Geological Survey, University of Alaska (Fairbanks and Anchorage), Alaska Natural Heritage Program, Cooperative Extension Service, Bureau of Land Management, and Alaska Division of Forestry.

**Table D-5**  
**Occurrence of Invasive Plant Species in the Proposed Port MacKenzie Rail Extension Study Area<sup>a</sup>**  
**(page 1 of 2)**

Common Name	Species	Occurrences (sites) in Study area	Status <sup>b</sup>
Common Yarrow	<i>Achillea millefolium</i>	76	AWS
Crested Wheatgrass	<i>Agropyron cristatum</i>	8	NR
Smooth Brome	<i>Bromus inermis</i>	21	NR
Cheatgrass	<i>Bromus tectorum</i>	1	NR
Shepherd's Purse	<i>Capsella bursa-pastoris</i>	23	NR
Sticky Chickweed	<i>Cerastium glomeratum</i>	6	NR
Lamb's Quarters	<i>Chenopodium album</i>	47	NR
Canada Thistle	<i>Cirsium arvense</i>	1	P
Annual Hawksbeard	<i>Crepis tectorum</i>	75	NR
Quackgrass	<i>Elymus repens</i>	51	P
Siberian Rye	<i>Elymus sibiricus</i>	10	NR
Wormseed Mustard	<i>Erysimum cheiranthoides</i>	1	NR
Splitlip Hempnettle	<i>Galeopsis bifida</i>	1	NR
Brittlestem Hempnettle	<i>Galeopsis tetrahit</i>	7	P
Common Sunflower	<i>Helianthus annuus</i>	2	AWS
Orange Hawkweed	<i>Hieracium aurantiacum</i>	1	NR
Narrow-leaf Hawkweed	<i>Hieracium umbellatum</i>	1	NR
Foxtail Barley	<i>Hordeum jubatum</i>	22	NR
Leporinum Barley	<i>Hordeum murinum</i>	53	NR
Ornamental Jewelweed	<i>Impatiens glandulifera</i>	2	NR
Fall Dandelion	<i>Leontodon autumnalis</i>	4	NR
Common Peppergrass	<i>Lepidium densiflorum</i>	1	NR
Oxeye Daisy	<i>Leucanthemum vulgare</i>	1	NR
Butter and Eggs	<i>Linaria vulgaris</i>	14	R
Large-leaf Lupine	<i>Lupinus polyphyllus</i>	40	AWS
Purple Loosestrife	<i>Lythrum salicaria</i>	45	NR
Pineappleweed	<i>Matricaria discoidea</i>	1	NR
White Sweet Clover	<i>Melilotus alba</i>	90	NR
Yellow Sweet Clover	<i>Melilotus officinalis</i>	41	NR
Reed Canarygrass	<i>Phalaris arundinacea</i>	11	NR
Timothy	<i>Phleum pratense</i>	1	NR
Plantain	<i>Plantago major</i>	85	R
Annual Bluegrass	<i>Poa annua</i>	96	R
Knotweed	<i>Polygonum aviculare</i>	49	NR
Black Bindweed	<i>Polygonum convolvulus</i>	45	R
Willow Weed	<i>Polygonum lapathifolium</i>	1	NR
Bohemian Knotweed	<i>Polygonum x bohemicum</i>	10	NR
Norweigan Cinquefoil	<i>Potentilla norvegica</i>	1	NR

**Table D-5**  
**Occurrence of Invasive Plant Species in the Proposed Port MacKenzie Rail Extension Study Area<sup>a</sup>**  
 (page 2 of 2)

Common Name	Species	Occurrences in Study area	Status <sup>b</sup>
Sheep Sorrel	<i>Rumex acetosella</i>	70	NR
Curly Dock	<i>Rumex crispus</i>	27	NR
Garden Dock	<i>Rumex longifolius</i>	14	NR
Common Groundsel	<i>Senecio vulgaris</i>	1	NR
Tumble Mustard	<i>Sisymbrium altissimum</i>	7	NR
Perennial Sowthistle	<i>Sonchus arvensis</i>	2	P
Spurry	<i>Spergula arvensis</i>	19	NR
Common Chickweed	<i>Stellaria media</i>	24	NR
Common Tansy	<i>Tanacetum vulgare</i>	1	NR
Common Dandelion	<i>Taraxacum officinale</i>	102	AWS
Alsike Clover	<i>Trifolium hybridum</i>	89	NR
Red Clover	<i>Trifolium pratense</i>	21	NR
White Clover	<i>Trifolium repens</i>	67	NR
Scentless Mayweed	<i>Tripleurospermum perforata</i>	13	NR
Tufted Vetch	<i>Vicia cracca</i>	44	R

<sup>a</sup> Source: ANHP *et al.*, 2008.

<sup>b</sup> State of Alaska: R = restricted; P = prohibited; AWS = Agricultural Weed Seed; NR = not regulated.

## D.2 Alaska Railroad Corporation Vegetation Management

The Alaska Railroad Corporation (ARRC) manages vegetation on railbeds and facilities to:

- Eliminate plants and roots that impede drainage, or obstruct or interfere with train movement.
- Allow track inspectors to visually inspect ties, track, and fasteners.
- Maintain sight lines at crossings, and visibility of track flags, mile posts, and other signage.
- Remove potential fuels that can cause wildland fires.
- Maintain safe walking areas.
- Prevent the spread of invasive and noxious weeds (ARRC, 2008).

ARRC has used mechanical and other nonchemical methods of vegetation management since 1983 (STB, 2008). ARRC has intermittently requested permission to use herbicides to assist in management of vegetation, but the Alaska Department of Environmental Conservation has consistently denied ARRC requests for a permit under 18 Alaska Administrative Code 90.505 (ADEC, 2007). ARRC has used alternative vegetation management techniques such as hand clearing by inmates, hydro-ax brush cutting, modified ballast regulator, reballasting, hot water/steam, weed burning and infrared burning treatments, all of which have been largely ineffective at controlling vegetation within the track ballast section (Kemenosh, 1999). ARRC uses manual and mechanical vegetation control, including brush-cutting the right-of-way (ROW) and manual and mechanical ballast clearing (Burnham *et al.*, 2003). The Federal Railroad



Administration has cited ARRC annually under the Railroad Safety Statutes (49 Code of Federal Regulations 213.37) for failing to control vegetation (Kemenosh, 1999).

Plants that tend to dominate the railbed are common within the study area and are difficult to remove, including tree saplings (balsam poplar, birch, aspen); shrubs (alder, willow, raspberry [*Rubus idaeus*]); herbaceous plants (fireweed, bluejoint reedgrass, horsetail, common yarrow [*Achillea millefolium*]); and introduced weeds (dandelion [*Taraxacum officinale*], white sweetclover [*Melilotus alba*], annual bluegrass [*Poa annua*], and alsike clover [*Trifolium hybridum*]) (Table D-3; Kemenosh, 1999; Lipkin, 2007).

Mechanical removal of vegetation results in ground disturbance, which promotes erosion. Use of heavy equipment for spot-control of vegetation could result in removal of more vegetation than necessary. Vegetation removed by hand clearing would result in some soil disturbance if weeds are pulled. Use of chain saws or other hand-held power tools would reduce soil disturbance but the chance of small fuel spills would be increased. Removing excess vegetation by burning would increase the risk of fire spreading beyond the vegetation management target area and potentially result in the unintentional destruction of forest resources (ARRC, 1984).

### D.3 Fire Management and Wildland Fire History

The proposed Port MacKenzie Rail Extension alternatives would cross three levels of fire protection (modified, full, and critical) under the Alaska Fire Services 2008 fire management options (Table D-6 and Figure D-1).

**Table D-6**  
**Fire Protection Levels in the 200-Foot Right-of-Way of Proposed Port MacKenzie Rail Extension Segments (acres)<sup>a</sup>**

Segment	Critical	Full	Modified	Total <sup>b</sup>
Mac West	0	470	24	493
Mac East	0	469	0	469
Connector 1	0	68	45	113
Connector 2	0	74	16	90
Connector 3	0	123	0	123
Big Lake	485	36	0	521
Houston	155	97	0	251
Houston North	197	0	0	197
Houston South	210	0	0	210
Willow	176	539	0	715
<b>Totals (percent of total)</b>	<b>1,223 (38)</b>	<b>1,876 (59)</b>	<b>85 (3)</b>	<b>3183 (100)</b>

<sup>a</sup> Source: BLM, 2008a.

<sup>b</sup> Totals might not equal sums of values due to rounding.

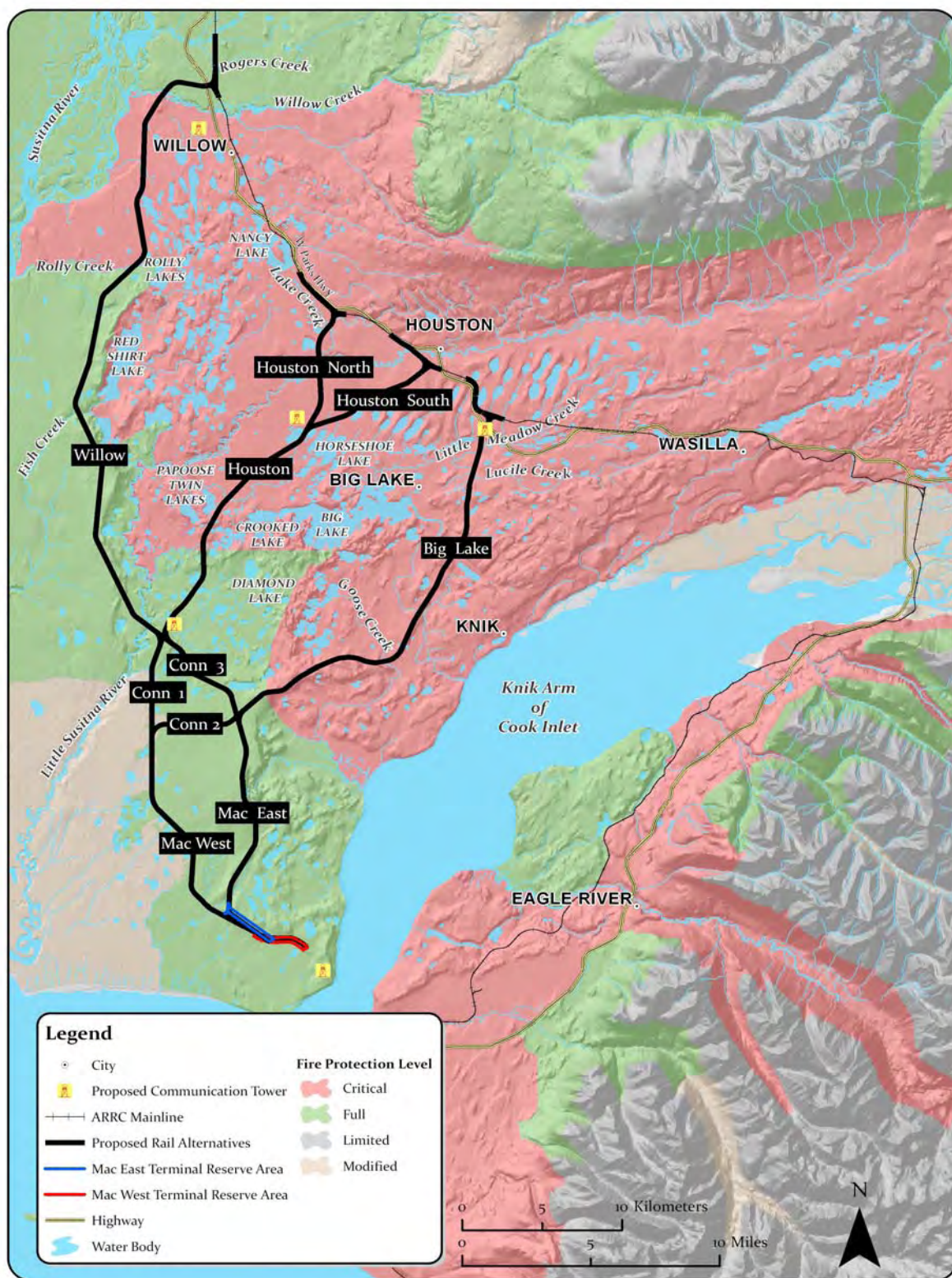


Figure D-1. Fire Protection Levels in the Proposed Port MacKenzie Rail Extension Study Area (BLM, 2008a)

The Bureau of Land Management Alaska Wildland Fire Management Plan (BLM, 2005) defines fire protection levels as follows:

- **Critical** – These areas are the highest priority for suppression actions and assignment of firefighting resources. This designation indicates human life, inhabited property, structural resources, or developed areas are at risk.
- **Full** – These areas are the second priority for fire suppression. This designation provides for protection of cultural and recreational resources, uninhabited structures, and high-value natural resources.
- **Modified** – The goal in these areas is to balance acres burned with suppression costs, and to use wildland fire where appropriate to accomplish land and resource management objectives. This designation is the most flexible fire management option.

Of the area the alternatives would cross, 59 percent falls within the full protection classification, followed by critical protection (38 percent), and modified protection (3 percent). Table D-7 summarizes the post-1950 fire history for each segment.

<b>Segment</b>	<b>Miles of Track Proposed</b>	<b>Miles of Proposed Track Burned</b>	<b>Percent of Proposed Track Burned</b>	<b>Acres Burned in Proposed Right-of-Way<sup>b</sup></b>
Connector 1	4.8	0.0	0	0
Connector 2	3.7	0.0	0	0
Connector 3	5.2	0.0	0	0
Houston	10.4	0.8	8	20
Houston North	8.6	3.4	40	81
Houston South	9.2	7.9	86	182
Mac East	10.9	0.0	0	0
Mac West	11.9	0.0	0	0
Willow	30.1	0.0	0	0
Big Lake	21.2	5.3	25	129
<b>Totals<sup>c</sup></b>	<b>116.0</b>	<b>17.4</b>	<b>15</b>	<b>412</b>

<sup>a</sup> Source: BLM, 2008b.

<sup>b</sup> The total of 412.3 acres burned in the proposed right-of-way is 15 percent of the total proposed right-of-way area.

<sup>c</sup> Totals might not equal sums of values due to rounding.

Of the approximately 116 miles of segments, wildland fires have burned approximately 17 miles, or approximately 15 percent (Table D-7 and Figure D-2). The most significant fire in the study area was the 1996 Millers Reach 2 fire, which burned 37,348 forested acres in the Big Lake area between Knik and Houston, including 129 acres in the proposed rail line ROW. This human-caused fire destroyed 440 buildings and cost more than \$12 million to suppress (Stekel, 1996; AWFCG, 2006). Much of the study area can be considered “wildland-urban interface,” where structures and human development intermingle with natural vegetation. Wildland fires in or near these areas can pose significant threats to homes, other structures, and forested habitat. Fire season in Alaska begins as soon as the snow melts and is most active from June through August (BLM, 2005). Construction of the proposed rail line railbed and the associated ROW would create a fuel break that could interrupt wildland fires and potentially contribute to increased fuel



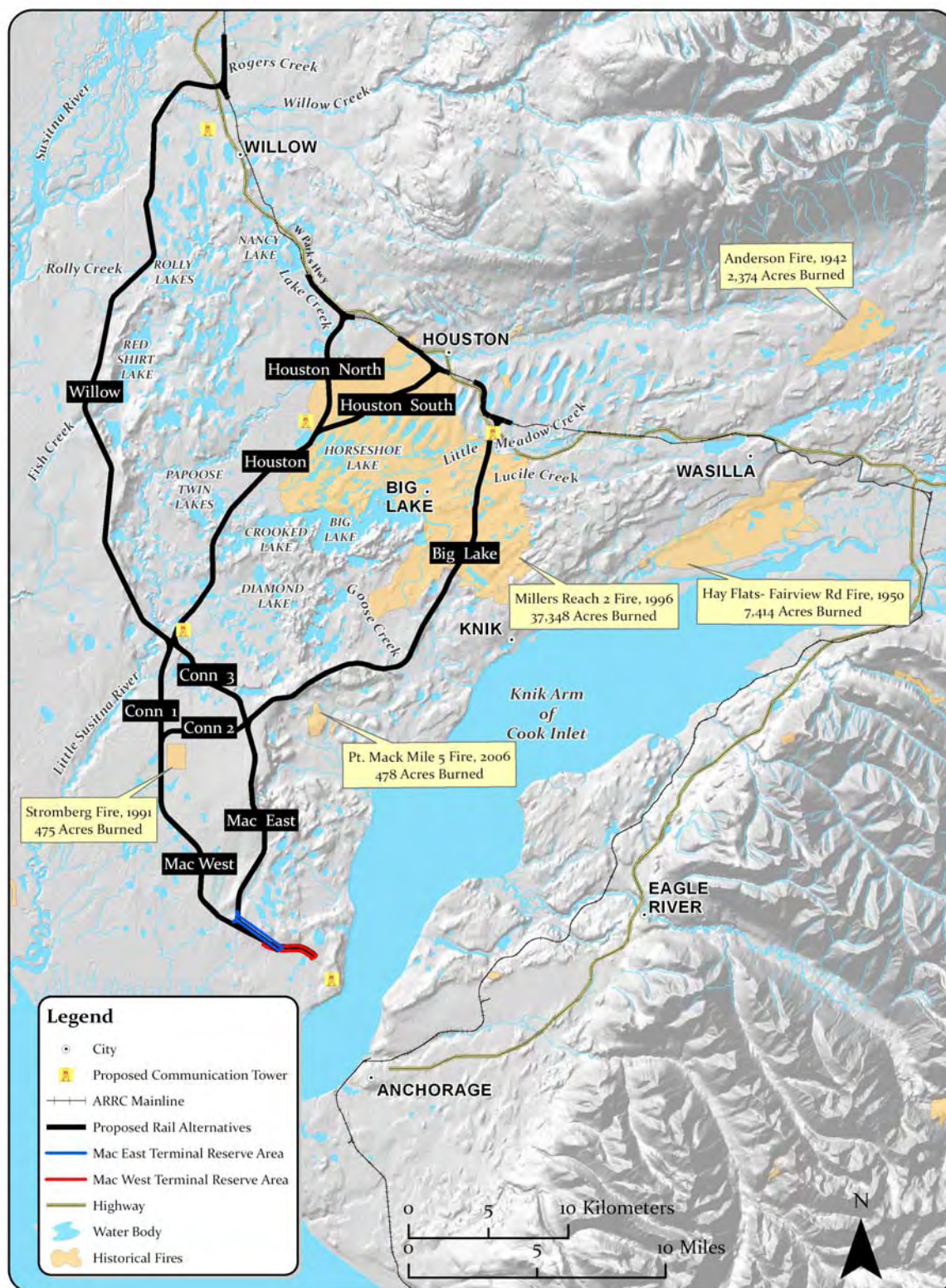


Figure D-2. Fire History in the Proposed Port MacKenzie Rail Extension Study Area (BLM, 2008b)

accumulations and an increased risk for intense wildland fire activity. In some areas, a fuel break might be beneficial in the protection of late-succession riparian forests and private property.

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## **APPENDIX E**

### **WILDLIFE RESOURCES**

## E. WILDLIFE RESOURCES

This appendix provides supporting information on wildlife resources in the proposed Port MacKenzie Rail Extension project area and Alaska Department of Fish and Game (ADF&G) Game Management Subunits 14A and 14B, which the rail line would cross (Figure E-1). The descriptions of wildlife occurrence, abundance, distribution, harvest, and life histories provided in this appendix and used in analyses were compiled by SEA from various sources including ADF&G Subunit 14A and 14B management reports and data (ADF&G, 2008a; 2008b); the ADF&G Wildlife Notebook Series; Alaska Natural Heritage Program (UAA, 2008); Arctos v3 database UAM Mammals (UAF, 2008); U.S. Fish and Wildlife Service data (Conant *et al.*, 2007; Platte *et al.*, 2008); and breeding bird survey data (Shook and Ritchie, 2008; Sauer *et al.*, 2008; Benson, 2001).

### E.1 Affected Environment

Table E-1 lists mammals in the study area, which include 3 big game mammals, 14 furbearers, 10 other mammals, and 3 marine mammals. Migratory and resident birds in the study area include 20 waterfowl and waterbirds, 7 raptors and owls, 5 shorebirds, 2 seabirds, and 42 landbirds.

#### E.1.1 Bears

Both black and brown bears can become a problem when they have learned to associate humans with food. Bears become conditioned to human food when they access improperly stored garbage, or human or animal foods. Bears have a keen sense of smell and habitually seek the same foods in the same places year after year. Because cubs learn from their mothers where and on what to forage, cubs conditioned to human foods condition their cubs to human foods. Once exposed to human foods and garbage, conditioned bears can become such a problem that they ultimately must be eradicated.

#### E.1.2 Moose

Moose are distributed throughout Alaska and are the primary large mammal harvested in the Matanuska-Susitna River Valley. Primary predators of moose calves in the study area are wolves, black bears, and grizzly bears. The moose population in Subunit 14A has remained relatively stable at approximately 5,500 to 6,500 animals (Figure E-2); the moose population in Subunit 14B has remained relatively stable at approximately 1,500 moose (Figure E-3).

Based on early winter densities listed in Table E-1, there would be an estimated 2,873 moose within 5 miles of the proposed rail line alternatives. Seasonal migrants could increase the density of moose in the Matanuska-Susitna Valley. Assuming an estimated 30 percent of the moose in the project area are seasonal migrants from the foothills of Subunit 14A, 862 moose would be expected to move into and out of the project area, potentially crossing the proposed rail twice a year, once during spring and once during fall. Figure E-4 illustrates generalized seasonal moose movement patterns based on information in Masteller (undated) and Modafferi (1988) and moose calving, rutting and winter habitats (ADF&G, 1985).



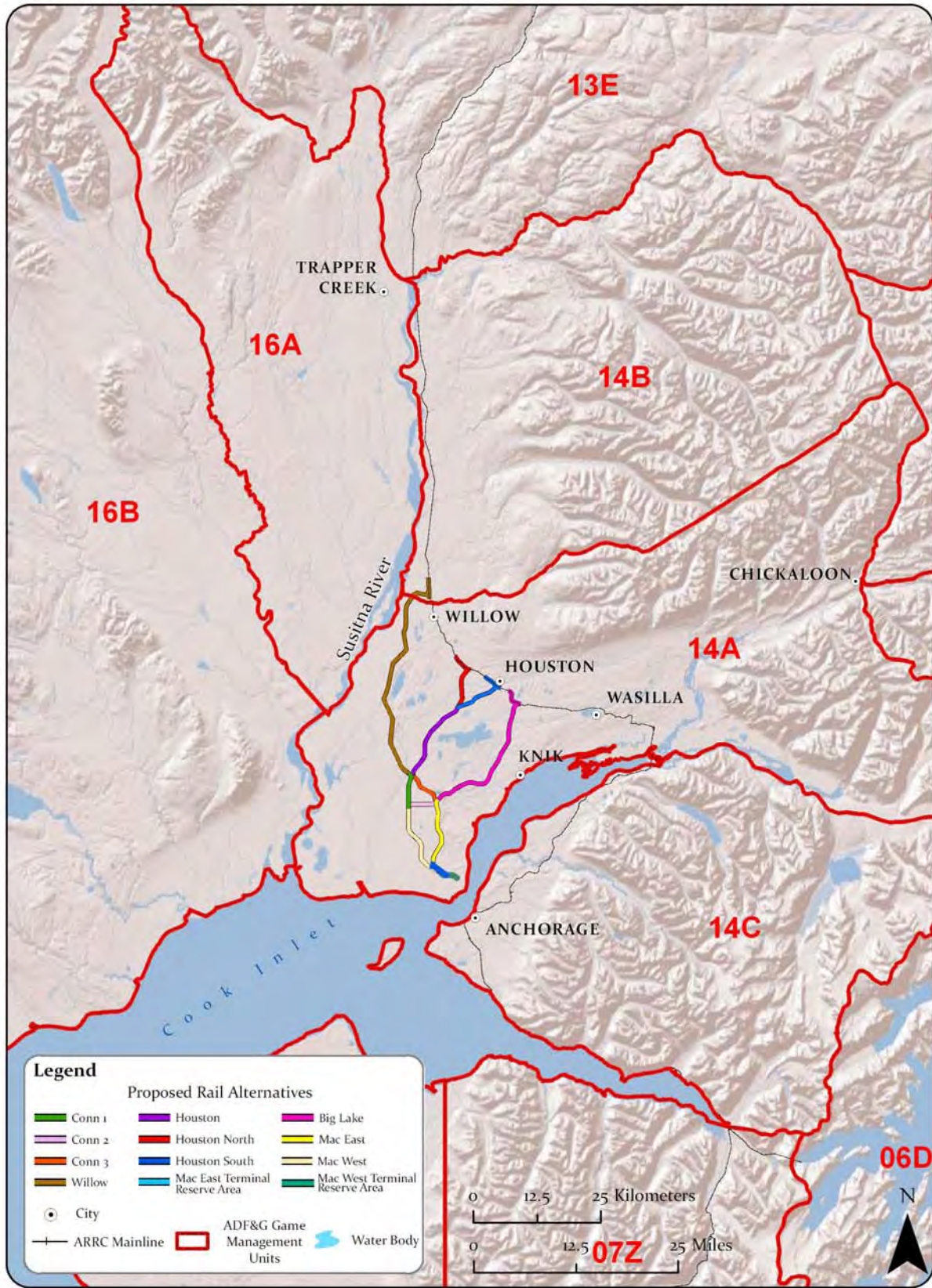


Figure E-1. Alaska Department of Fish and Game Management Units

**Table E-1**  
**Mammals in the Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 1 of 6)**

Common Name	Scientific Name	Generalized Hunting Season	Mean Annual Harvest 2002-2007 (Game Management Unit 14) <sup>b</sup>	Population Estimate (Game Management Unit 14)	Project Area Density
Big Game Mammals					
Black Bear	<i>Ursus americanus</i>	No closed season	153.2 (20 percent)	500 to 1,000	8 to 15 per 100 square miles
Brown Bear	<i>Ursus arctos</i>	September to June	10.2 (5 percent)	185 to 239	3 to 4 per 100 square miles
Moose	<i>Alces alces</i>	August and October	622.7 (6 percent)	10,213	Approximately 3.6 per square mile
Moose	<i>Alces alces</i>	August and October	467.8 (7 percent)	14A, 6,600	3.6 per square mile
Moose	<i>Alces alces</i>	August and October	61.7 (4 percent)	14B, 1,413	0.7 per square mile
Wolf	<i>Canis lupus</i>	August to May	23.6 (21 percent)	115	18 to 21 packs 2 wolves per 100 square miles
Common Name	Scientific Name	Home Range Size	General Habitats	Breeding and Den Habitat	
Furbearers					
Beaver	<i>Castor canadensis</i>	0.6 mile stream channel; 43.5 acres, solitary; 19.0 acres, families	Streams, ponds, backwaters; forages on shrubs and aquatic vegetation	Breed January or February, young born late April to June; bank den or lodge near dammed streams or on ponds, 2 feet by 3 feet by 3 feet, used year-round	
Coyote	<i>Canis latrans</i>	2,471 to 24,710 acres	Forests, grasslands, scrub/shrub, agricultural; forage primarily on hares, rodents, carrion	Breed February and March; den in hills, floodplain terrace, aboveground or hollow logs, used only during whelping; dens might be occupied during March to July; might use more than one den; dens used repeatedly	

**Table E-1**  
**Mammals Occurring Within the Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 2 of 6)**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Home Range Size</b>	<b>General Habitats</b>	<b>Breeding and Den Habitat</b>
<b>Furbearers</b>				
Short-tailed Weasel (Ermine)	<i>Mustela erminea</i>	24.7 to 49.4 acres	Forests, riparian woodlands and scrub/shrub; forages primarily on small rodents and lemmings but will eat birds, eggs, frogs, fish, insects	Breed mid to late summer, young born early May through June; den in rodent burrows, stumps, rock outcrops; can remain June to August
Least Weasel	<i>Mustela nivalis</i>	17.3 acres females, 64.2 acres males	Woodlands, riparian, grassy fields and meadows; forages on small mammals, especially voles, lemmings, and other mice; might consume other small vertebrates, insects, or worms when rodents are scarce	Uses burrows made by voles
Lynx	<i>Lynx canadensis</i>	5 to 100 square miles (3,200 to 64,000 acres), depending on food abundance	Spruce and hardwood forest habitats, especially mosaic habitats caused by fire; forage primarily on hares, grouse, ptarmigan, squirrels, rodents	Breed March and early April, kittens born May to June; den in natural shelters such as windblown trees, hollow logs, log jams, rock crevices
Marten	<i>Martes americana</i>	1 to 15 square miles (640 to 9,600 acres), depending on food abundance	Black spruce forests and bogs; forage primarily on rodents, but also eat berries, small birds, eggs, vegetation, and carrion	Breed July and August, young born in April or early May; den in natural shelters such as hollow logs, windblown trees, standing snags/hollow trees
Mink	<i>Mustela vison</i>	20 to 50 acres female, 1,900 acres male	Riparian forests, marshes and scrub/shrub wetlands; forage on fish, birds, eggs, rodents	Breed March to April, most young born in June; den in burrow or hollow log near a pond or stream; young remain in den through July
Muskrat	<i>Ondatra zibethicus</i>	2.5 to 4.9 acres, marshes; 0.25 mile, streams	Marshes, riparian areas, floodplains of large rivers, ponds; forage on aquatic plants, lilies, sedges, grasses, mussels, small fish	Breed during late April to mid-May, two litters per year, first mid-June, second mid-July; den in vegetation piles 2 to 3 feet above water and 5 to 6 feet in diameter; also might tunnel into banks used year-round
Red Fox	<i>Vulpes vulpes</i>	Summer, 150 to 1,300 acres; winter, 3,104 to 49,658 acres	Mosaic habitats, lowland marshes; forages on rodents, small mammals, birds, eggs, insects, vegetation, carrion	Breed February to March, young born April to May; dens 15 to 20 feet long, usually on the side of a hill with several entrances; might use abandoned wolf dens

**Table E-1**  
**Mammals Occurring Within the Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 3 of 6)**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Home Range Size</b>	<b>General Habitats</b>	<b>Breeding and Den Habitat</b>
<b>Furbearers</b>				
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	0.5 to 1 acre	Spruce forests; forages on seeds, berries, buds, fungi, and occasionally insects and bird eggs	Breed February and March, young born April to May; nest in holes in tree trunks or constructed mass of twigs, leaves, mosses and lichens; several nests maintained per territory; ground burrows or middens used primarily for food storage
River Otter	<i>Lontra canadensis</i>	1.2 to 48.5 miles, waterway	Riparian habitats, rivers, lakes, marshes; forage on fish, mussels, snails, birds, mammals, vegetation	Breed in May, young born in late January to June; burrows in soil or uses fallen/hollow logs, overturned tree root wads, might use year-round
Snowshoe Hare	<i>Lepus americanus</i>	Average 7 to 15 acres, up to 39.5 acres	Forests, woody wetlands, bogs; forages on succulent vegetation, in winter eats twigs, buds, bark of small trees	Breed February to mid-August, young born May to August; nest in ground depression or hollow log
Wolf	<i>Canis lupus</i>	600 square miles (384,000 acres) per pack	Variable; forages on moose, caribou, hares, rodents, birds	Breed February and March, young born in May or early June; den in well-drained soil up to 10 feet deep, young moved from den during mid to late summer
Wolverine	<i>Gulo gulo</i>	Female, 50 to 100 square miles (32,000 to 64,000 acres); male, 240 square miles (153,600 acres)	Variable, coniferous forests, riparian areas could be important winter habitat; forages on moose and caribou carcasses, rodents, squirrels, hares, birds	Breed May through August, young born January through April; den made in snow; occupies dens in caves, under fallen trees, or thickets when inactive

**Table E-1**  
**Mammals Occurring Within the Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 4 of 6)**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Home Range Size</b>	<b>General Habitats</b>	<b>Breeding and Den Habitat</b>
<b>Other Mammals</b>				
Little Brown Bat	<i>Myotis lucifugus</i>	Migratory; winters in caves, occur in area during spring through fall, summer home range poorly understood	Forest, woody wetlands, riparian; forages in woodlands near water; eats flying insects	Breed September to October, young born in late spring to early summer; use standing snags/hollow trees; availability of suitable maternity sites might limit abundance and distribution
Northern Bog Lemming	<i>Synaptomys borealis</i>	Less than 1 acre; sociable, may form small colonies	Bog, muskeg, mixed and coniferous forests; forages on grasses, sedges, other vegetation	Breed May to August, several litters per year; active year-round; nest in burrows in soil or uses logs/debris
Porcupine	<i>Erethizon dorsatum</i>	Summer range 125 to 250 acres; winter range smaller; densities 25 to 58 per square mile in good habitat	Coniferous and mixed forests and woodlands; forages on inner bark of trees, evergreen needles in winter, buds in spring, roots, leaves, fruits in summer, fruits in fall	Breed September to November or December, young born in spring to winter; den in rock outcrops, live hollow trees, hollow logs; shelter in dense conifers in winter
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	Up to 86.5 acres; summer, 7 to 12 acres	Coniferous and mixed forests, riparian woods; forages on fungi, lichens, insects, nuts, buds, seeds, fruit	Breed February to May; in lower latitudes might have two litters; nest in tree cavities, leaf nests, underground burrows; use large number of alternative den sites in Alaska
Dusky Shrew	<i>Sorex monticolus</i>	0.3 to 1 acre	Forest and wetland habitats, sphagnum bogs; forages on insects and other small invertebrates such as worms, sowbugs, mollusks	Breed April to August; nest in burrows or fallen logs/debris

**Table E-1**  
**Mammals Occurring Within the Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 5 of 6)**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Home Range Size</b>	<b>General Habitats</b>	<b>Breeding and Den Habitat</b>
<b>Other Mammals</b>				
Masked Shrew	<i>Sorex cinereus</i>	0.1 acre	Forest and wetland habitats; forages on insects, invertebrates, carrion, small vertebrates, occasionally seeds	Breed March to September, usually 2 litters; nest in shallow burrows or above ground in logs and stumps
Tundra Shrew	<i>Sorex tundrensis</i>	Less than 1 acre	Dwarf shrub habitats, tundra vegetation; forages on insects, invertebrates	Nest in soil or logs/debris
Meadow Vole	<i>Microtus pennsylvanicus</i>	0.25 acre; dispersal probably more than 0.6 mile	Grasslands, woody wetlands, bogs, riparian; forages on vegetation, grasses, roots and seeds; burrows and uses fallen logs/debris	Breed throughout year with sufficient snow cover; peak activity April to October
Northern Red-backed Vole	<i>Myodes rutilus</i>	Less than 1 acre	Coniferous forests; forages on fungi, berries, lichens, moss, insects, grass	Young born May to September; nest in burrows or fallen log/debris
Tundra Vole	<i>Microtus oeconomus</i>	Male, 0.9 acre; female, 0.3 acre	Muskeg, grasslands, coniferous and mixed woodlands; nests in shallow burrows in soil or uses logs/debris; forages on green grasses and sedges in summer, stores rhizomes and grass seeds for winter	Probably breed throughout the year; population densities can fluctuate

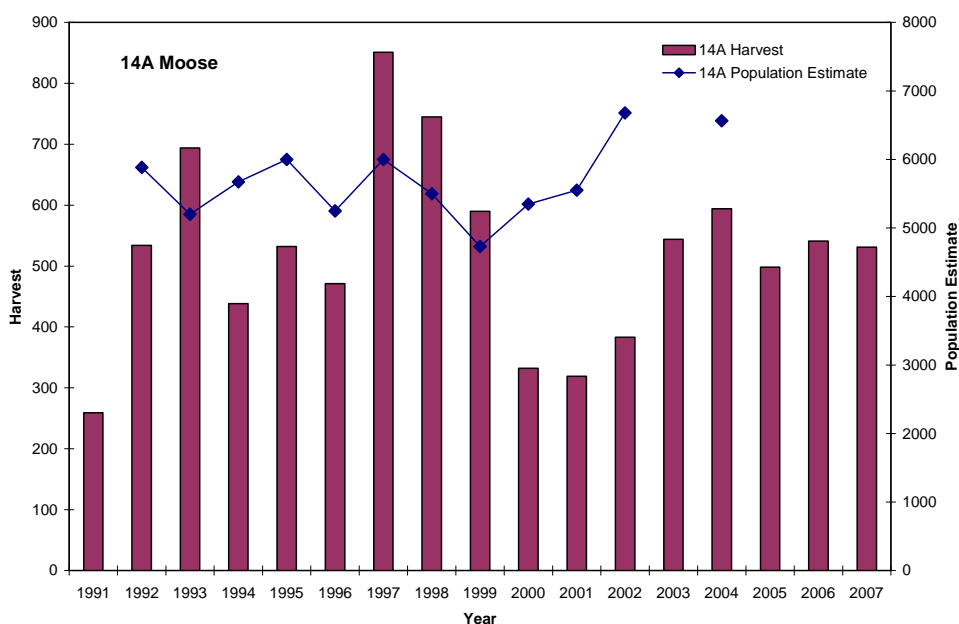
**Table E-1**  
**Mammals Occurring Within the Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 6 of 6)**

Common Name	Scientific Name	Home Range Size	General Habitats	Breeding and Den Habitat
<b>Marine Mammals</b>				
Beluga Whale	<i>Delphinapterous leucas</i> Cook Inlet stock	Commonly occur in Knik Arm of Cook Inlet	Near shore, river mouth/tidal rivers; forage on fish (eulachon and salmon, can follow prey up river); squid, crabs, clams; social	Concentrate near river mouths along the northern reaches of Cook Inlet in spring and early summer; calving areas near mouth of Susitna River, Turnagain Arm
Harbor Porpoise	<i>Phocoena phocoena</i>	Seasonal; inshore movements in summer, offshore in winter; movements follow prey species	Near shore, pelagic, river mouth/tidal rivers; forage on fish, squid and crustaceans; Shy, not often observed, but can be heard; solitary or social	Breed in summer, calf born May to early August; mothers and calves move to sheltered coves soon after parturition
Harbor Seal	<i>Phoca vitulina</i>	Can make seasonal migrations of hundreds of miles	Near shore, pelagic, river mouth/tidal rivers, can occur miles up river; forage on fish, squid, crustaceans; solitary	Young May to June in Gulf of Alaska; haulout on intertidal sandbars, rocky shores, ice

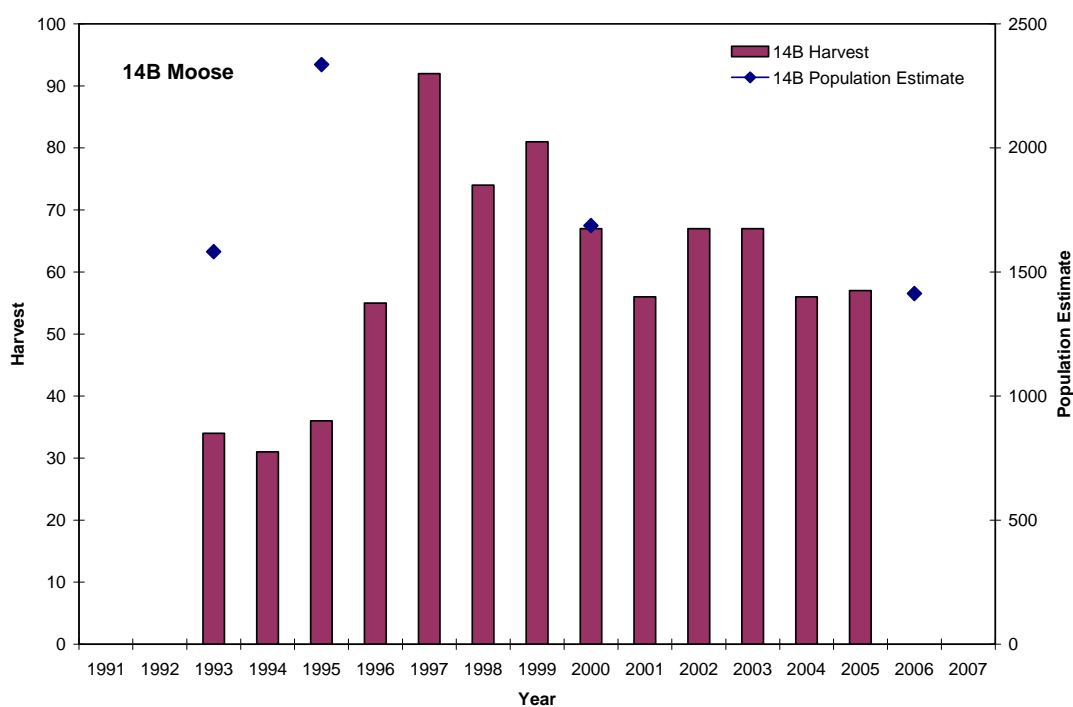
<sup>a</sup> Sources: Kavalok, 2005; Kavalok, 2007; McDonough, 2002a; McDonough, 2002b; Peltier, 2006a; Peltier, 2006b; ADF&G Alaska Wildlife Notebook; NatureServe, Animal Diversity Web.

<sup>b</sup> Harvest percentage of estimated population appears in parentheses. Mean annual harvest of moose for Subunits 14A and 14B are listed on separate table lines. All harvested wolves are required to be sealed (registered and recorded). Wolf harvest records are reported from sealing files. No same day airborne hunting of wolves was in effect for Game Management Unit 14 during the reporting period. The National Research Council estimated sustainable harvest rates for wolves from 30 percent up to 40 percent of early winter populations (NRC, 1997).



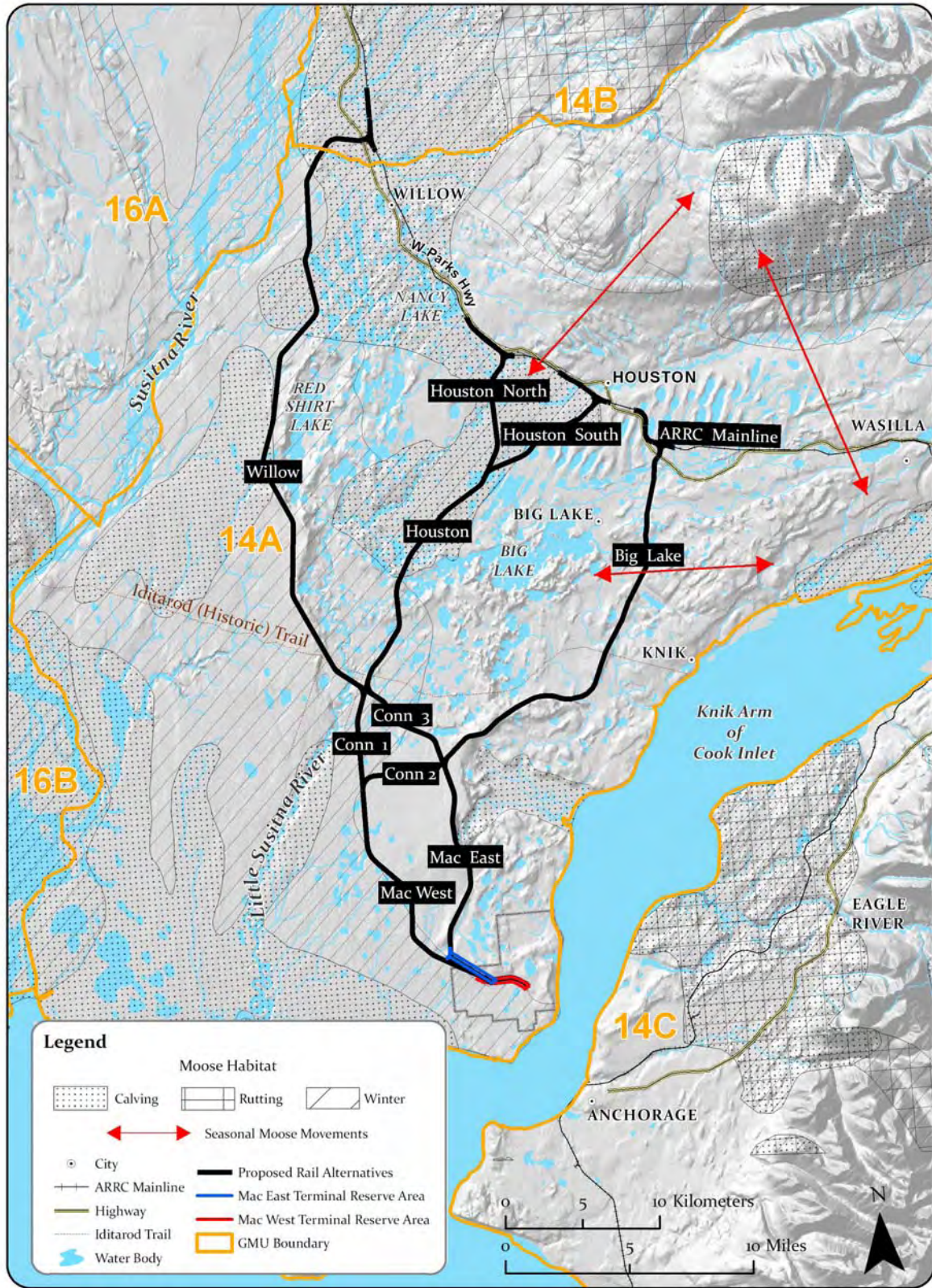


**Figure E-2. Population and Harvest Trends for Subunit 14A Moose 1991 to 2007 (Peltier, 2006a)**



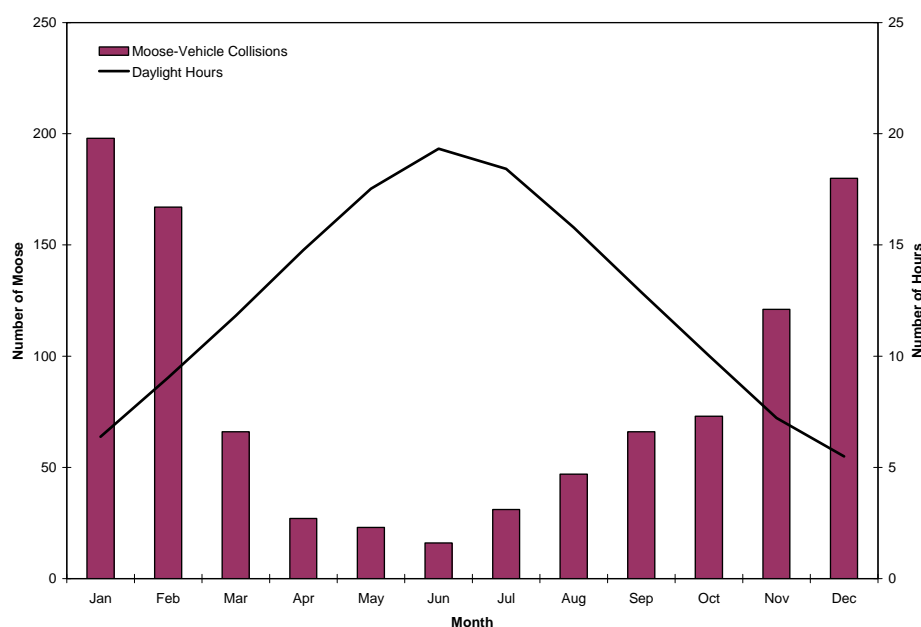
**Figure E-3. Population and Harvest Trends for Subunit 14B Moose 1993 to 2005 (Peltier, 2006b)**





**Figure E-4. Moose Habitats and Generalized Movement Patterns (ADF&G, 1985; Masteller, undated; Modafferi, 1988)**

Increased development in the Matanuska-Susitna Valley has contributed to increased vehicle traffic killing more moose. Accidental death by collisions with vehicles and trains accounts for an average of 25 percent of combined accidental and harvest mortality for moose (McDonough, 2002b; Del Frate, 2004; Peltier, 2006a). Moose-train collision mortality accounted for an average of 9 percent of all accidental moose mortality during 1990 to 2007 (McDonough, 2002b; Del Frate, 2004; Peltier, 2006a; see additional discussion under *Moose-Train Collision Mortality*). A little more than half of the moose-vehicle collision mortalities occurred on four roadways during 2000 to 2008 (ADF&G, 2008b) – Parks Highway (26 percent), Glenn Highway (11 percent), Knik-Goose Bay Road (11 percent), and Point MacKenzie Road (4 percent). Moose-vehicle collisions increase in frequency during the dark winter months (Figure E-5). An average of 176 moose-vehicle collision mortalities occurred annually in Subunit 14A from 1990 to 2007 (McDonough, 2002b; Del Frate, 2004; Peltier, 2006a).

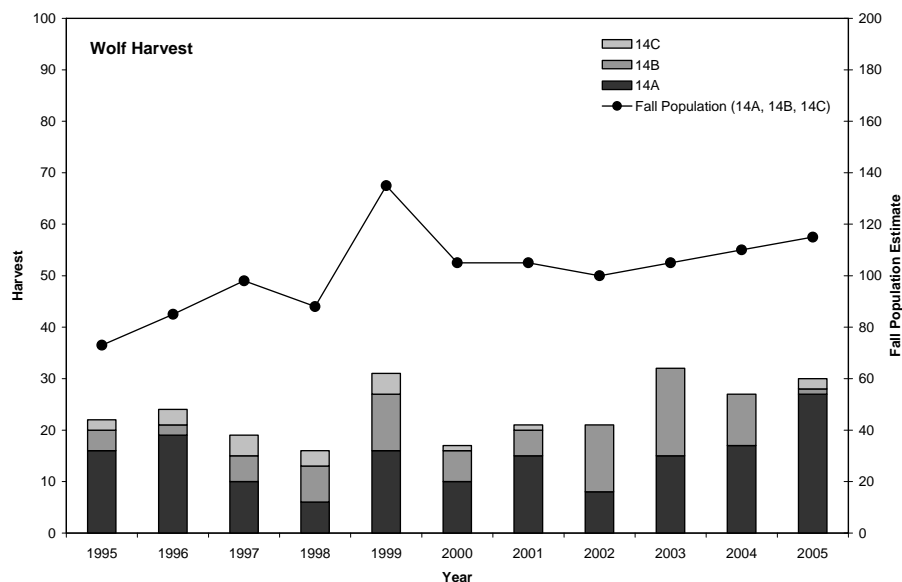


**Figure E-5. Monthly Moose-Vehicle Collision Mortalities from 2000 to 2008 for Subunits 14A and 14B with Daylight Hours by Month (ADF&G, 2008b)**

### E.1.3 Wolves

Wolves are carnivorous and in Game Management Unit 14 their primary foods are moose and caribou. During winter a pack might kill a moose every few days. Wolf and prey populations can be affected by a number of factors, including weather and food availability. Severe winters coupled with active wolf and bear predation can contribute to local big game scarcities. Wolf populations increased during the 1990s, in part due to high prey densities and excess winter moose mortality caused by deep snows during the winters of 1989-1990 and 1994-1995, and because of high wolf densities in surrounding Game Management Units (Peltier, 2006c). Figure E-6 shows current population and harvest trends for wolves in Game Management Unit 14. Wolves in Subunit 14B have been infested with dog-biting louse (*Trichodectes canis*), which reduces the value of an animal's pelt. This is a concern because it could lead to reduced harvest, which could exacerbate the spread of the dog-biting louse throughout other regions of the state as

wolves disperse from high population density areas (Peltier, 2006c). ADF&G attempted to capture and treat all members of the infested pack, and deployed medicated baits to treat coyotes, feral dogs, and wolves, although infested wolves were caught the following winter (Peltier, 2006c).



**Figure E-6. Harvest and Population Trends for Wolves 1995 to 2005 in Game Management Unit 14 (Peltier, 2006c)**

## E.1.4 Furbearers and Other Mammals

There are no completed population surveys for furbearers or other nongame mammals. Wildlife managers request that trappers qualitatively evaluate furbearer abundance to indicate if populations appear to be increasing or decreasing; Table E-2 lists these qualitative trends (Blejwas, 2006).

**Table E-2**  
**Estimated Abundance, Population Trends, and Harvest of Furbearers for Subunits 14A and 14B in the Port MacKenzie Rail Extension Study Area<sup>a</sup> (page 1 of 2)**

Common Name	Species	Relative Abundance	Trend	14A Harvest Estimate <sup>b</sup>	14B Harvest Estimate <sup>b</sup>	Totals
Beaver	<i>Castor canadensis</i>	Common	None	6	6	12
Coyote	<i>Canis latrans</i>	Common	None	15	15	30
Short-tailed Weasel (Ermine)	<i>Mustela erminea</i>	Common	None	21	0	21
Lynx	<i>Lynx canadensis</i>	Scarce	None	0	0	0
Marten	<i>Martes americana</i>	Common	None	27	0	27
Mink	<i>Neovison vison</i>	Common	None	88	27	115
Muskrat	<i>Ondatra zibethicus</i>	Common	None	272	39	311
Red Fox	<i>Vulpes vulpes</i>	Common	None	124	52	176



**Table E-2**  
**Estimated Abundance, Population Trends, and Harvest of Furbearer for Subunits 14A and 14B in the Port MacKenzie Rail Extension Study Area<sup>a</sup> (page 2 of 2)**

Common Name	Species	Relative Abundance	Trend	14A Harvest Estimate <sup>b</sup>	14B Harvest Estimate <sup>b</sup>	Totals
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	Abundant	None	15	15	30
River Otter	<i>Lontra canadensis</i>	Common	None	10	0	10
Wolf	<i>Canis lupus</i>	Common	None	4	4	8
Wolverine	<i>Gulo gulo</i>	Scarce	None	0	0	0
<b>All Furbearers</b>				<b>582</b>	<b>158</b>	<b>740</b>
<b>Prey Species</b>						
Hare	<i>Lepus americanus</i>	Common	Increasing	(Abundance, high levels still increasing; ADF&G 2008c)		
	<i>cf. Falcipennis canadensis</i> or translocated <i>Bonasa umbellus</i>	Common	Decreasing			
Grouse				(Moderate levels; ADF&G 2008c)		
Ptarmigan	<i>Lagopus</i> spp.	Common	None	(Moderate numbers; ADF&G 2008c)		
Mice/Rodents		Abundant	Increasing			

<sup>a</sup> Source: Blejwas, 2006.

<sup>b</sup> Harvest estimates are for the 2004-2005 season based on the ADF&G Trapper Questionnaire. Questionnaire totals were adjusted by percent of sealed furs using either the reported percentages or the average percentage for Region 2 – Southcentral Alaska.

## E.1.5 Birds

Resident (designated R in tables) birds in the study area include owls, magpies, ravens and jays, woodpeckers, chickadees, and finches. Many other birds in the project area are migratory, arriving or passing through in spring beginning with raptors and waterfowl in April and continuing with the arrivals of songbirds through May and passing through or leaving in late summer and fall (during July through October). Migratory birds fall into two classes, (1) long distance (designated L in tables) or Neotropical migrants (those that winter south of the Tropic of Cancer), and (2) short distance (designated S in tables) or Nearctic migrants (those that winter north of the Tropic of Cancer). Birds documented in the project area include 20 waterfowl and waterbirds, 5 shorebirds, 2 seabirds, and 42 landbirds.

## E.1.6 Raptors and Owls

Bald eagles in Cook Inlet can be either summer residents, arriving in late April and departing by freeze-up in mid-to-late September, or residents. Bald-eagle nests in the project area during 2008 were primarily associated with habitats along the Little Susitna River and Willow Creek, occurring primarily in deciduous trees (92 percent), balsam poplar (54 percent), birch (23 percent), and aspen (15 percent) (Shook and Ritchie, 2008). Waterfowl are important in the diet of nesting bald eagles, especially in spring. Salmon are more important prey in late summer and fall.

## E.1.7 Landbirds

Landbirds belong to many diverse groups and include both migrant and resident birds. Resident birds remain active during the winter. Resident woodpeckers, chickadees, crossbills, and redpolls rely primarily on fruit and seed crops. Resident ravens and gray jays scavenge on winter or predator-killed carrion. However, many landbirds feed primarily on insects, which are not available during winter, and these birds remain in Southcentral Alaska only during the summer breeding season when insects are abundant.

## E.1.8 Birds of Conservation Concern

Various reviews and listings of birds in need of conservation have been developed. Table E-3 lists birds featured in the ADF&G Comprehensive Wildlife Conservation Plan (ADF&G, 2006) that have been documented to occur in the project area during the breeding season. Footnotes in Table E-3 also indicate other conservation designations by the U.S. Fish and Wildlife Service, International Wader Study Group, and Boreal Partners in Flight (a working group made up of government representatives and individuals). There are no Federal- or state-listed threatened or endangered bird species in the project area. The U.S. Fish and Wildlife Service defines Birds of Conservation Concern as species, subspecies, and populations that are not already federally listed as threatened or endangered but that without additional conservation actions, are likely to become candidates for Federal listing (USFWS, 2008).

**Table E-3**  
**Birds of Conservation Concern Documented During the Breeding Season Within the Study Area<sup>a</sup>**  
(page 1 of 3)

Species (Migration) <sup>b</sup>	Status <sup>c</sup>	Global Rank <sup>d</sup>	Alaska Rank <sup>d</sup>	Alaska Abundance	Alaska Trend <sup>e</sup>	Rationale
American Three-toed Woodpecker (R)	ADF&G	G5	S4	200,000	+6.5%	Sensitive to forest management – cavity nester
Arctic Tern (L)	BCC, ADF & G	G5	S4B	~10,000	–	Long-term decline, sensitive to disturbance
Bald Eagle (S)	BCC, PIF, ADF&G	G4	S4B/S4N	20,000	+	Contaminant-affected, sensitive to changes in forests
Bank Swallow (L)	ADF&G	G5	S5B	3,000,000	+4.1%	Long-term declines
Belted Kingfisher (S)	ADF&G	G5	S5	140,000	-2.5%	Widespread long-term population declines
<b>Blackpoll Warbler (L)</b>	PIF, ADF&G	G5	S4B	4,000,000	-3.8%	Long-term declines, sensitive to changes in riparian habitats
Boreal Chickadee (R)	ADF&G	G5	S5	1,100,000	-0.5%	Sensitive to forest management – cavity nester
Brown Creeper (R)	ADF&G	G5	S4	50,000	-22.3%	Sensitive to forest management – cavity nester
Cliff Swallow (L)	ADF&G	G5	S4B	1,700,000	-6.0%	Long-term Alaska declines
Common Loon (S)	ADF&G	G5	S4/S5B, S4N	9,000	±	Sensitive to disturbance, contaminants
Dark-eyed Junco (S)	ADF&G	G5	S3N/S5B	40,000,000	-1.1%	Widespread long-term population declines

**Table E-3**  
**Birds of Conservation Concern Documented During the Breeding Season Within the Study Area<sup>a</sup>**  
 (page 2 of 3)

<b>Species (Migration)<sup>b</sup></b>	<b>Status<sup>c</sup></b>	<b>Global Rank<sup>d</sup></b>	<b>Alaska Rank<sup>d</sup></b>	<b>Alaska Abundance</b>	<b>Alaska Trend<sup>e</sup></b>	<b>Rationale</b>
Golden-crowned Kinglet (R)	ADF&G	G5	S5	170,000	-0.5%	Sensitive to forest management – canopy nester
Great Gray Owl (S)	PIF, ADF&G	G5	S3	10,000	UNK	Sensitive to forest management – canopy nester
Great Horned Owl (S)	ADF&G	G5	S5	140,000	UNK	Sensitive to forest management – canopy nester
Hairy Woodpecker (R)	ADF&G	G5	S4	120,000	+6.8%	Sensitive to forest management – cavity nester
Hermit Thrush (S)	ADF&G	G5	S4B	1,300,000	-1.8%	Long-term declines
Horned Grebe (S)	BCC, ADF&G	G5	S5	UNK	UNK	Long-term range contraction
Lesser Yellowlegs (L)	BCC, ADF&G	G5	S5B	150,000	-4%	Boreal forest habitat loss, alteration
Long-tailed Duck (S)	ADF&G	G5	S5B, S4N	220,000	-5.5%	Significant long-term declines
Murrelet species (S)	BCC, ADF&G	G3/G4	S2/S3	850,000	–	Significant long-term declines, marbled murrelet sensitive to forest management
Merlin (S)	ADF&G	G5	S3/S4B, S3N	40,000	±	Sensitive to contaminants
Northern Flicker (S)	ADF&G	G5	S5B	180,000	+0.2%	Sensitive to forest management – cavity nester
Northern Harrier (L)	ADF&G	G5	S4B, S3N	7,000	UNK	Sensitive to disturbance, contaminants
<b><i>Olive-sided Flycatcher (L)</i></b>	BCC, PIF & ADF&G	G4	S3/S4B	200,000	-3.3%	Long-term decline, sensitive to forest management – canopy nester
Osprey (L)	ADF&G	G5	S2B	1,900	±	Sensitive to disturbance, contaminants
Pacific Loon (S)	ADF&G	G5	S5B, S4/S5N	69,000	±	Sensitive to disturbance, contaminants
Pine Siskin (S)	ADF&G	G5	S5	500,000	+5.5%	Long-term declines, sensitive to forest management – canopy nester
Red-breasted Nuthatch (R)	ADF&G	G5	S4	110,000	-0.6%	Sensitive to forest management – cavity nester
Red-necked Grebe (S)	ADF&G	G5	S4/S5B, S4N	12,000	–	Long-term declines, sensitive to disturbance
Red-tailed Hawk (L)	ADF&G	G5	S5B	20,000	UNK	Sensitive to disturbance, habitat loss
Red-throated Loon (L)	ADF&G	G5	S3B, S2/S3N	10,000	±	Sensitive to disturbance, contaminants
Rusty Blackbird (S)	BCC, PIF, ADF&G	G4	S4B	400,000	-5.8%	Long-term declines, sensitive to climate and riparian habitat changes

**Table E-3**  
**Birds of Conservation Concern Documented During the Breeding Season Within the Study Area<sup>a</sup>**  
 (page 3 of 3)

Species (Migration) <sup>b</sup>	Status <sup>c</sup>	Global Rank <sup>d</sup>	Alaska Rank <sup>d</sup>	Alaska Abundance	Alaska Trend <sup>e</sup>	Rationale
Sharp-shinned Hawk (L)	ADF&G	G5	S4B, S3N	15,000	UNK	Migrant raptor, sensitive to habitat loss or alteration
Solitary Sandpiper (L)	BCC, ADF&G	G5	S2B	4,000	-4.1%	Long-term declines, sensitive to changes in boreal wetlands
Surf Scoter (S)	ADF&G	G5	S4B, S4N	275,000	-2%	Significant long-term declines
<b><i>Townsend's Warbler (L)</i></b>	PIF, ADF&G	G5	S5B	1,500,000	+0.2%	Sensitive to forest management – canopy nester
Varied Thrush (S)	PIF, ADF&G	G5	S5	6,000,000	-0.1%	Sensitive to forest management – canopy nester
Violet-green Swallow (L)	ADF&G	G5	S4B	800,000	-5.1%	Long-term Alaska declines
White-crowned Sparrow (L)	ADF&G	G5	S5B	13,000,000	-1.9%	Long-term Alaska declines
White-winged Crossbill (R)	PIF, ADF&G	G5	S5	2,000,000	+4.3%	Sensitive to forest management – canopy nester
White-winged Scoter (S)	ADF&G	G5	S4B, S4N	100,000	-2%	Significant long-term declines
Wilson's Warbler (L)	PIF & ADF&G	G5	S3B	7,000,000	+1%	Sensitive to changes in riparian habitats

<sup>a</sup> Sources: Rosenberg, 2004; ADF&G, 2006; Shook and Ritchie, 2008; Sauer *et al.*, 2008; Platte *et al.*, 2008; URS, 2006.

<sup>b</sup> (R) = Resident; (S) = Short-distance migrant; (L) = Long-distance migrant.

<sup>c</sup> Status: BCC – USFWS, 2008; PIF – Rosenberg, 2004; ADF&G – ADF&G, 2006. Bold italic type indicates ADF&G Species of Special Concern (ADF&G, 1998).

<sup>d</sup> Rankings: G5 = Globally secure; G4 = Globally apparently secure; S5 = State secure; S4 = State apparently secure; S3 = State vulnerable; SNR = State not ranked; N = Non-breeding; B = Breeding.

<sup>e</sup> Average annual long-term population trend in Alaska portion of the Boreal Partners in Flight Bird Conservation Region 4 (the Bird Conservation Region within which the project would lie and for which population estimates have been generated) (Rosenberg, 2004; ADF&G, 2006). UNK represents unknown condition, – represents declining trend of unknown magnitude; + represents increasing trend of unknown magnitude, ± represents stable population trend.

## E.2 Environmental Consequences

### E.2.1 Wildlife Habitat Loss and Alteration

Construction of the proposed Port MacKenzie Rail Extension would result in habitat loss and alteration along the rail line alternatives. This section describes the expected level of wildlife use and habitat loss within the 200-foot ROW. Habitat loss for all habitat types at the level of habitat mapping used for analysis (Homer *et al.*, 2004) would represent less than 1 percent of available habitats for wildlife within 5 miles of the project alternatives.

#### E.2.1.1 Furbearers

Furbearers are a diverse group. Table E-4 lists and describes habitat use, breeding season, den type and use, home range size estimates, and estimated habitat impact area for common furbearers in the project area. The table includes estimates of average impacts to furbearer and other mammal habitat from the eight proposed alternatives.

**Table E-4**  
**SEA's Estimated Average Habitat Loss Impacts for Mammals Within the 200-foot Right-of-Way<sup>a</sup> (page 1 of 2)**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Home Range Size</b>	<b>General Habitats</b>	<b>Estimated Impacts<sup>b</sup></b>
<b>Furbearers</b>				
Beaver	<i>Castor canadensis</i>	0.6 mile stream channel; 43.5 acres, solitary; 19.0 acres, families	Streams, ponds, backwaters; forages on shrubs and aquatic vegetation	Wetlands Average is 317 acres or 7 to 17 beavers
Short-tailed Weasel (Ermine)	<i>Mustela erminea</i>	24.7 to 49.4 acres	Forests, riparian woodlands and scrub/shrub; forages primarily on small rodents and lemmings, but will eat birds, eggs, frogs, fish, insects	Forested and wetland habitats Average is 1,036 acres or 21 to 42 ermine
Least Weasel	<i>Mustela nivalis</i>	17.3 acres, females; 64.2 acres, males	Woodlands, riparian, grassy fields and meadows; forages on small mammals, especially voles, lemmings and other mice; might consume other small vertebrates, insects, or worms when rodents are scarce	Forested and wetland habitats Average is 1,036 acres or 16 to 60 least weasels
Mink	<i>Mustela vison</i>	20 to 50 acres, female; 1,900 acres, male	Riparian forests, marshes and scrub/shrub wetlands; forages on fish, birds, eggs, rodents	Wetlands Average is 317 acres or 6 to 16 female mink
Muskrat	<i>Ondatra zibethicus</i>	2.5 to 4.9 acres marshes; 0.25 mile streams	Marshes, riparian areas, floodplains of large rivers, ponds; forages on aquatic plants, lilies, sedges, grasses, mussels, small fish	Emergent and shrub/scrub wetlands Average is 146 acres or 30 to 58 muskrats
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	0.5 to 1 acre	Spruce forests; forages on seeds, berries, buds, fungi, and occasionally insects and bird eggs	Evergreen and mixed closed forests Average is 463 acres or 463 to 926 red squirrels
Snowshoe Hare	<i>Lepus americanus</i>	Average 7 to 15 acres, up to 39.5 acres	Forests, woody wetlands, bogs; forages on succulent vegetation, in winter eats twigs, buds bark of small trees	Forested and wetland habitats Average is 1,036 acres or 26 to 69 hares



**Table E-4**  
**Estimated Average Habitat Loss Impacts for Mammals Within the 200-foot Right-of-Way<sup>a</sup> (page 2 of 2)**

Common Name	Scientific Name	Home Range Size	General Habitats	Estimated Impacts <sup>b</sup>
<b>Other Mammals</b>				
Northern Bog Lemming	<i>Synaptomys borealis</i>	Less than 1 acre; sociable, can form small colonies	Bog, muskeg, mixed and coniferous forests; forages on grasses, sedges, other vegetation	Evergreen and mixed forests and wetland habitats Average is 802 acres or 802 lemmings
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	Up to 86.5 acres, summer 7 to 12 acres	Coniferous and mixed forests, riparian woods; forages on fungi, lichens, insects, nuts, buds, seeds, fruit	Evergreen and mixed closed forests Average is 463 acres or 5 to 39 flying squirrels
Porcupine	<i>Erethizon dorsatum</i>	Summer range 125 to 250 acres, winter range smaller; densities 25 to 58 per square mile in good habitat	Coniferous and mixed forests and woodlands; forages on inner bark of trees, evergreen needles in winter, buds in spring, roots, leaves, fruits in summer and fall	Evergreen and mixed forests Average is 485 acres or 19 to 44 porcupine
Shrews	<i>Sorex</i> spp.	0.3 to 1 acre	Forest and wetland habitats, sphagnum bogs; forages on insects and other small invertebrates such as worms, sowbugs, mollusks	Forest and wetlands Average is 1,036 acres or 1,036 to 3,453 shrews
Voles	<i>Microtus</i> spp. and <i>Myodes rutilus</i>	0.25 acre, less than 1 acre	Grasslands, woody wetlands, bogs, riparian; forages on vegetation, grasses, roots and seeds, burrows and uses fallen log/debris. Coniferous forests; forages on fungi, berries, lichens, moss, insects, grass	Forest and wetlands Average is 1,036 acres or 1,036 to 4,144 voles

<sup>a</sup> Source: Compiled from various sources including the ADF&G Alaska Wildlife Notebook; NatureServe, Animal Diversity Web; habitat from Homer *et al.*, 2004.

<sup>b</sup> Average impact within the 200-foot right-of-way, terminal reserve, stream relocation, and road relocation areas by habitat type for eight proposed alternatives. Does not represent an alternative.

### **E.2.1.2 Birds**

Tables E-5, E-6, and E-7 list bird species present in the study area based on ground-based surveys (Sauer *et al.*, 2008; URS, 2006; Benson, 2001); SEA estimated numbers within 5 miles of the proposed alternatives (798-square-mile area) are based on regional aerial waterfowl surveys (Conant *et al.*, 2007; Mallek and Groves, 2008; Platte *et al.*, 2008). Raptor surveys were completed for the proposed alignments by the Applicant (Shook and Ritchie, 2008). Some waterfowl and waterbirds nest in habitats the proposed rail line would cross and many more waterfowl and waterbirds migrate through the Cook Inlet region on their way to and from nesting grounds in Western and Arctic Alaska. Spring and fall waterbird migration and summer occurrence data for the Port MacKenzie area were collected during 2005 by the Knik Arm Bridge and Toll Authority (URS, 2006). Most waterfowl and waterbirds nest on the ground near waterbodies. Tables E-8, E-9, and E-10 list habitat loss or disturbance (as the number of affected birds) due to construction of the alternatives based on project area nest season densities or nest occurrence within 0.5 mile of the alternatives. SEA estimated impacts to birds of conservation concern due to habitat loss (Table E-8).

## **E.2.2 Wildlife Habitat Fragmentation**

This section provides detailed results for habitat fragmentation analyses completed by SEA for the proposed rail line segments and alternatives summarized in Chapter 5. Across the project area, habitat patch (habitat areas of a single type) sizes averaged larger for open water, agriculture, and developed habitat types, with a mean shape index of 1.4 hectares (about 3.5 acres) (Table E-9). The small mean patch size, generally less than 1.4 hectares, and low perimeter values, generally less than 600 meters (about 1,970 feet), indicate that most habitat patches were defined by 16, 30 meter by 30 meter (about 98 by 98 feet) pixels (Table E-9). Core areas, interior areas of habitat patches greater than 40 hectares (about 99 acres) in size, averaged larger for open water and agriculture habitat types (Table E-9). Core areas of wildlife habitats the proposed rail line segment combinations would cross averaged 6 to 49 times larger than core areas of habitat patches greater than 40 hectares distributed throughout the project area (Table E-9).

Table E-10 lists habitat core areas the proposed rail line alternatives would cross and fragment. The Mac East-Big Lake Alternative would potentially fragment the smallest number and area of core forested and wetland habitats; the Mac East-Connector 3-Willow Alternative would potentially fragment the greatest number of core forest and wetland habitats; and the Mac West-Connector 1-Houston-Houston South and Mac East-Connector 3-Houston-Houston South alternatives would potentially fragment the largest area of core forested and wetland habitat (Table E-10). The Mac West-Connector 1-Houston-Houston North and Mac West-Connector 1-Houston-Houston South alternatives would potentially fragment the smallest area of core forest habitat, while the Mac West-Connector 1-Willow and Mac East-Connector 3-Willow alternatives would potentially fragment the largest area of core forest habitat (Table E-10). The Mac East-Connector 3-Willow and Mac East-Big Lake alternatives would potentially fragment the smallest area of core wetland habitat, while the Mac West-Connector 1-Houston-Houston South Alternative would potentially fragment the largest area of core wetland habitat (Table E-10).

**Table E-5**  
**Shorebirds, Seabirds, and Landbirds Occurring During the Breeding Season and SEA's Estimated Habitat Loss Impacts Due to Construction of the Alternatives<sup>a</sup> (page 1 of 4)**

Common Name	Species	Primary Habitats	Study Area Density (birds per mile)	Alaska BCR 4 <sup>b</sup> Population Size (annual trend, Data Quality) <sup>c</sup>	Estimated Study Area Population <sup>d</sup>	Estimated Average Impact (number of birds) <sup>e,f</sup>	Estimated Minimum Impact (number of birds) <sup>g,f</sup>	Estimated Maximum Impact (number of birds) <sup>h,f</sup>
<b>Shorebirds</b>								
Greater Yellowlegs	<i>Tringa melanoleuca</i>	Forests, near water	0.12	j	Unknown	5	4	6
Lesser Yellowlegs	<i>Tringa flavipes</i>	Forests, near water	0.25	j	Unknown	9	8	11
Solitary Sandpiper	<i>Tringa solitaria</i>	Near water	0.03	j	Unknown	1	1	1
Spotted Sandpiper	<i>Actitis macularia</i>	Near water	j	j	Unknown	j	j	j
Common Snipe	<i>Gallinago gallinago</i>	Forests, near water	0.53	j	Unknown	20	17	25
<b>Total Shorebirds</b>					<b>Unknown</b>	<b>35</b>	<b>30</b>	<b>43</b>
<b>Seabirds</b>								
Herring Gull	<i>Larus argentatus</i>	Near water	0.07	j	Unknown	2	2	3
Glaucous-winged Gull	<i>Larus glaucescens</i>	Near water	0.03	j	Unknown	1	1	1
<b>Total Seabirds</b>					<b>Unknown</b>	<b>3</b>	<b>3</b>	<b>4</b>
<b>Landbirds</b>								
Belted Kingfisher (S)	<i>Ceryle alcyon</i>	Riparian shrub and forest	0.01	140,000 (-2.4%, 2 Y)	400	0	0	0
Downy Woodpecker (R)	<i>Picoides pubescens</i>	Forested	0.06	150,000	428	2	2	3
Hairy Woodpecker (R)	<i>Picoides villosus</i>	Needleleaf forest	0.06	120,000 (4.2%, 2 Y)	343	2	2	3
Three-toed Woodpecker (R)	<i>Picoides dorsalis</i>	Needleleaf forest	0.12	200,000 (1.2%, 3 O)	571	4	4	5
Northern Flicker (S)	<i>Colaptes auratus</i>	Needleleaf forest	0.01	180,000 (-0.7%, 2 Y)	514	0	0	0
Olive-sided Flycatcher (L)	<i>Contopus cooperi</i>	Needleleaf forest - black spruce	0.40	200,000 (-1.5%, 2 Y)	571	15	13	18
Western Wood-Peezee (L)	<i>Contopus sordidulus</i>	Riparian shrub - black spruce bogs/successional	0.14	200,000 (-4.0%, 2 Y)	571	5	4	7
Alder Flycatcher (L)	<i>Empidonax alnorum</i>	Shrub/successional	4.46	11,000,000 (-0.4%, 2 Y)	31,411	166	140	205

Table E-5

Shorebirds, Seabirds, and Landbirds Occurring During the Breeding Season and Estimated Habitat Loss Impacts Due to Construction of the Alternatives<sup>a</sup> (page 2 of 4)

Common Name	Species	Primary Habitats	Study Area Density (birds per mile)	Alaska BCR 4 <sup>b</sup> Population Size (annual trend, Data Quality) <sup>c</sup>	Estimated Study Area Population <sup>d</sup>	Estimated Average Impact (number of birds) <sup>e,f</sup>	Estimated Minimum Impact (number of birds) <sup>g,f</sup>	Estimated Maximum Impact (number of birds) <sup>h,f</sup>
<i>Landbirds (continued)</i>								
Say's Phoebe (L)	<i>Sayornis saya</i>	Tundra and shrub habitats	0.00	40,000	114	0	0	0
Gray Jay (R)	<i>Perisoreus canadensis</i>	Needleleaf and mixed forest	0.26	3,000,000 (2.2%, 2 Y)	8,567	10	8	12
Black-billed Magpie (R)	<i>Pica pica</i>	Forested	0.06	50,000	143	2	2	3
Common Raven (R)	<i>Corvus corax</i>	Needleleaf forest	0.18	60,000 (2.5%, 2 Y)	171	7	6	8
Tree Swallow (L)	<i>Tachycineta bicolor</i>	Broadleaf and needleleaf forest	0.48	700,000 (3.8%, 2 Y)	1,999	18	15	22
Violet-green Swallow (L)	<i>Tachycineta thalassina</i>	Forested, near water	0.27	800,000	2,284	10	8	12
Bank Swallow (L)	<i>Riparia riparia</i>	Bluffs, near water	0.03	3,000,000	8,567	1	1	1
Cliff Swallow (L)	<i>Petrochelidon pyrrhonota</i>	Bluffs, near water	0.04	1,700,000	4,854	2	1	2
Black-capped Chickadee (R)	<i>Poecile atricapillus</i>	Riparian broadleaf, and needleleaf forest	0.31	1,400,000 (1.9%, 2 Y)	3,998	11	10	14
Boreal Chickadee (R)	<i>Poecile hudsonia</i>	Needleleaf forest	0.07	1,100,000 (0.7%, 2 Y)	3,141	3	2	3
Red-breasted Nuthatch (R)	<i>Sitta canadensis</i>	Forested	0.01	110,000	314	0	0	0
Brown Creeper (R)	<i>Certhia americana</i>	Forested	0.00	50,000	143	0	0	0
Golden-crowned Kinglet (S)	<i>Regulus satrapa</i>	Forested	0.01	170,000	485	0	0	1
Ruby-crowned Kinglet (S)	<i>Regulus calendula</i>	Open needleleaf and mixed forests	0.97	6,000,000	17,133	36	30	45
Swainson's Thrush (L)	<i>Catharus ustulatus</i>	Riparian needleleaf and mixed forest	3.17	18,000,000	51,399	118	99	146

Table E-5

Shorebirds, Seabirds, and Landbirds Occurring During the Breeding Season and Estimated Habitat Loss Impacts Due to Construction of the Alternatives<sup>a</sup> (page 3 of 4)

Common Name	Species	Primary Habitats	Study Area Density (birds per mile)	Alaska BCR 4 <sup>b</sup> Population Size (annual trend, Data Quality) <sup>c</sup>	Estimated Study Area Population <sup>d</sup>	Estimated Average Impact (number of birds) <sup>e,f</sup>	Estimated Minimum Impact (number of birds) <sup>g,f</sup>	Estimated Maximum Impact (number of birds) <sup>h,f</sup>
<i>Landbirds (continued)</i>								
Hermit Thrush (S)	<i>Catharus guttatus</i>	Riparian needleleaf forest and tall shrubs	0.07	1,300,000 (-1.1%, 2 Y)	3,712	3	2	3
American Robin (S)	<i>Turdus migratorius</i>	Forest and shrub	2.44	14,000,000 (1.6%, 2 Y)	39,977	91	77	112
Varied Thrush (S)	<i>Ixoreus naevius</i>	Forest and shrub	0.33	6,000,000	17,133	12	10	15
Orange-crowned Warbler (L)	<i>Vermivora celata</i>	Low and tall shrub	1.60	13,000,000 (-0.3%, 2 Y)	37,122	60	50	74
Yellow Warbler (L)	<i>Dendroica petechia</i>	Needleleaf forest and shrub	0.06	1,600,000 (-0.7%, 2 Y)	4,569	2	2	3
Yellow-rumped Warbler (L)	<i>Dendroica coronata</i>	Needleleaf forest	2.82	16,000,000 (0.9%, 2 Y)	45,688	105	89	130
Townsend's Warbler (L)	<i>Dendroica townsendi</i>	Mature needleleaf forest	0.00	1,500,000 (0.9%, 3 O)	4,283	0	0	0
Blackpoll Warbler (L)	<i>Dendroica striata</i>	Riparian forest and shrub	0.94	4,000,000 (-2.7%, 2 Y)	11,422	35	30	43
Northern Waterthrush (L)	<i>Seiurus noveboracensis</i>	Black spruce forest	0.45	3,000,000 (7.8%, 2 Y)	8,567	17	14	21
Wilson's Warbler (L)	<i>Wilsonia pusilla</i>	Mixed forest and shrub	0.15	7,000,000 (1.1%, 2 Y)	19,989	6	5	7
Savannah Sparrow (L)	<i>Passerculus sandwichensis</i>	Low shrub and graminoid	0.19	2,000,000 (-0.2%, 2 Y)	5,711	7	6	9
Fox Sparrow (S)	<i>Passerella iliaca</i>	Low and tall shrub	0.34	2,000,000 (2.4%, 2 Y)	5,711	13	11	16
Song Sparrow (S)	<i>Melospiza melodia</i>	Riparian and shrub	0.00	30,000	86	0	0	0
Lincoln's Sparrow (L)	<i>Melospiza lincolni</i>	Low shrub and black spruce bog	0.88	2,000,000 (7.8%, 2 Y)	5,711	33	28	40
White-crowned Sparrow (L)	<i>Zonotrichia leucophrys</i>	Low shrub	0.69	13,000,000 (-1.3%, 2 Y)	37,122	26	22	32

Table E-5

Shorebirds, Seabirds, and Landbirds Occurring During the Breeding Season and Estimated Habitat Loss Impacts Due to Construction of the Alternatives<sup>a</sup> (page 4 of 4)

Common Name	Species	Primary Habitats	Study Area Density (birds per mile)	Alaska BCR 4 <sup>b</sup> Population Size (annual trend, Data Quality) <sup>c</sup>	Estimated Study Area Population <sup>d</sup>	Estimated Average Impact (number of birds) <sup>e,f</sup>	Estimated Minimum Impact (number of birds) <sup>g,f</sup>	Estimated Maximum Impact (number of birds) <sup>h,f</sup>
<b>Landbirds (continued)</b>								
Dark-eyed Junco (S)	<i>Junco hyemalis</i>	Mix and needleleaf forest and tall shrub	2.42	40,000,000 (-0.3%, 2 Y)	114,220	90	76	111
Rusty Blackbird (L)	<i>Euphagus carolinus</i>	Needleleaf and mixed forest with wet graminoid	0.04	400,000 (6.3%, 2 Y)	1,142	2	1	2
White-winged Crossbill (R)	<i>Loxia leucoptera</i>	Mature needleleaf forest	0.27	2,000,000 (31.0%, 2 Y)	5,711	10	9	13
Pine Siskin (R)	<i>Carduelis pinus</i>	Needleleaf forest	0.46	500,000 (3.5%, 3 O)	1,428	17	14	21
<b>Total Landbirds<sup>i,k</sup></b>					<b>507,422</b>	<b>940</b>	<b>794</b>	<b>1,162</b>
<b>Total Resident<sup>k</sup> Landbirds</b>					<b>24,957</b>	<b>69</b>	<b>59</b>	<b>86</b>
<b>Total Long-Distance Migrant Landbirds<sup>k</sup></b>					<b>283,094</b>	<b>625</b>	<b>528</b>	<b>772</b>
<b>Total Short-Distance Migrant Landbirds<sup>k</sup></b>					<b>199,371</b>	<b>246</b>	<b>208</b>	<b>304</b>

<sup>a</sup> Sources: Sauer et al., 2008; Mallek and Groves, 2008; Platte et al., 2008; Benson, 2001; Shook and Ritchie, 2008; Blancher et al., 2007.

<sup>b</sup> Boreal Partners in Flight Bird Conservation Region 4 (the Bird Conservation Region within which the project would lie and for which population estimates have been generated).

<sup>c</sup> Blancher et al., 2007; ADF&G, 2006: Estimate Accuracy 2 = Poor, 3 = Fair; Breeding Bird Survey Data Quality Y=yellow-10% or more of the range covered, O = orange-<10% of range covered.

<sup>d</sup> SEA estimates based on project region density and area within 5 miles of all proposed segments (990 square miles) were generated only for species with an abundance estimate within the region.

<sup>e</sup> Average of eight proposed alternatives. Does not represent an alternative.

<sup>f</sup> Number of nesting birds impacted is based on the estimated project area linear nesting density multiplied by the route length for each of eight proposed alternatives.

<sup>g</sup> Minimum value for eight proposed alternatives.

<sup>h</sup> Maximum value for eight proposed alternatives.

<sup>i</sup> Resident, Long-Distance Migrants, and Short-Distance Migrants are categories of Landbirds.

<sup>j</sup> No available data; the species have been reported to occur in the area.

<sup>k</sup> Totals might not equal sums of values due to rounding.

**Table E-6**  
**Waterbird Nesting Season Densities, Estimated Study Area Populations, and SEA Estimated Habitat Loss<sup>a</sup> by Alternative<sup>b</sup>**

Common Name	Species	Kenai-Susitna Density (birds per square mile) <sup>d</sup>	Kenai-Susitna Population <sup>d</sup>	Estimated Study Area Population	Alternative <sup>c</sup>						
					Mac West-Connector 1-Willow	Mac West-Connector 1-Houston North	Mac West-Connector 1-Houston South	Mac West-Connector 2-Big Lake	Mac East-Connector 3-Houston North	Mac East-Connector 3-Houston South	Mac East-Big Lake
Waterbirds											
Common Loon	<i>Gavia immer</i>	0.82	1,810	657	2	1	1	1	2	1	1
Pacific Loon	<i>Gavia pacifica</i>	0.18	390	141	0	0	0	0	0	0	0
Red-throated Loon	<i>Gavia stellata</i>	0.01	30	11	0	0	0	0	0	0	0
Sandhill Crane	<i>Grus Canadensis</i>	0.12	263	95	0	0	0	0	0	0	0
Merganser	<i>Mergus spp.</i>	0.86	1,883	683	2	1	1	1	2	1	1
Geese and Swans											
Canada Goose	<i>Branta Canadensis</i>	0.40	878	319	1	1	1	1	1	1	1
Trumpeter Swan	<i>Cygnus buccinator</i>	0.28	618	224	1	0	0	0	1	0	0
Ducks											
American Green-winged Teal	<i>Anas crecca</i>	5.39	11,847	4,298	11	9	9	9	11	9	8
	<i>Anas americana</i>	2.96	6,522	2,366	6	5	5	5	6	5	5
	<i>Bucephala albeola</i>	0.54	1,189	431	1	1	1	1	1	1	1
Goldeneye	<i>Bucephala spp.</i>	1.99	4,371	1,586	4	3	3	3	4	3	3
Long-tailed Duck	<i>Clangula hyemalis</i>	0.15	329	119	0	0	0	0	0	0	0
	<i>Anas platyrhynchos</i>	5.57	12,244	4,442	11	9	9	9	10	9	9
Mallard	<i>Anas acuta</i>	1.53	3,372	1,223	3	2	3	3	3	2	2
	<i>Anas clypeata</i>	1.00	2,201	798	2	2	2	2	2	2	2
Redhead	<i>Aythya americana</i>	0.08	171	62	0	0	0	0	0	0	0
	<i>Aythya collaris</i>	0.87	1,911	693	2	1	1	1	2	1	1
Ring-necked Duck	<i>Aythya valisineria</i>	0.44	962	349	1	1	1	1	1	1	1
Canvasback	<i>Aythya valisineria</i>	0.44	962	349	1	1	1	1	1	1	1
Scaup	<i>Aythya spp.</i>	4.47	9,832	3,567	9	7	7	7	9	7	7
Scoter	<i>Melanitta spp.</i>	1.47	3,239	1,175	3	2	2	2	3	2	2
<sup>a</sup> Number of nesting birds impacted is based on the estimated project area nesting density multiplied by the area of footprint impact for the alternatives.											
<sup>b</sup> Sources: Conant <i>et al.</i> , 1999, 2000; Conant and Groves, 2001, 2002, 2003, 2004, 2005; Conant and Mallek, 2006; Mallek and Groves, 2007, 2008.											
<sup>c</sup> Mac West-Connector 1-Willow (1.75 square miles); Mac West-Connector 1-Houston-Houston North (1.34 square miles); Mac West-Connector 1-Houston-Houston South (1.36 square miles); Mac West-Connector 2-Big Lake (1.40 square miles); Mac East-Connector 3-Willow (1.76 square miles); Mac East-Connector 3-Houston-Houston North (1.34 square miles); Mac East-Connector 3-Houston-Houston South (1.36 square miles); and Mac East-Big Lake (1.25 miles).											
<sup>d</sup> Ten-year average 1999 to 2008. Stratum 1 Kenai-Susitna (2,200 square miles); population based on 10-year average.											

<sup>a</sup> Number of nesting birds impacted is based on the estimated project area nesting density multiplied by the area of footprint impact for the alternatives.

<sup>b</sup> Sources: Conant *et al.*, 1999, 2000; Conant and Groves, 2001, 2002, 2003, 2004, 2005; Conant and Mallek, 2006; Mallek and Groves, 2007, 2008.

<sup>c</sup> Mac West-Connector 1-Willow (1.75 square miles); Mac West-Connector 1-Houston-Houston North (1.34 square miles); Mac West-Connector 1-Houston-Houston South (1.36 square miles); Mac West-Connector 2-Big Lake (1.40 square miles); Mac East-Connector 3-Willow (1.76 square miles); Mac East-Connector 3-Houston-Houston North (1.34 square miles); Mac East-Connector 3-Houston-Houston South (1.36 square miles); and Mac East-Big Lake (1.25 miles).

<sup>d</sup> Ten-year average 1999 to 2008, Stratum 1 Kenai-Susitna (2,200 square miles); population based on 10-year average.

**Table E-7**  
**Raptors and Owls Potentially Impacted by Habitat Loss or Disturbance Due to Construction of the Alternatives<sup>a</sup>**

Common Name (Migration & Annual Alaska Trend 1966-2005)	Species	SEA Estimated Nests or Density in Study Area <sup>b</sup>	Alternatives						
			Mac West- Connector 1-Houston- North	Mac West- Connector 1-Houston- South	Mac West- Connector 2-Big Lake	Mac East- Connector 3-Willow	Mac East- Connector 3-Houston- North	Mac East- Connector 3-Houston- South	Mac East- Big Lake
Bald Eagle (S) (5.8%)	<i>Haliaeetus leucocephalus</i>	30	2 nests	2 nests	1 nest	5 nests	1 nest	1 nest	1 nest
Osprey	<i>Pandion haliaetus</i>	7	1 nest	1 nest	1 nest	1 nest	1 nest	1 nest	1 nest
Red-tailed Hawk (L) (-4.7%)	<i>Buteo jamaicensis</i>	44	6 nests	5 nests	0 nest	0 nest	6 nests	5 nests	0 nest
Great Horned Owl (R) (9.4%)	<i>Bubo virginianus</i>	7	1 nest	0 nest	0 nest	1 nest	2 nests	1 nest	0 nest
Great Gray Owl <sup>c</sup> (R)	<i>Strix nebulosa</i>	7	1 nest	1 nest	0 nest	0 nest	1 nest	1 nest	0 nest
Northern Saw- whet Owl	<i>Aegolius acadicus</i>	1.51 per square mile	2	2	3	3	2	2	2
Boreal Owl <sup>c</sup> (R)	<i>Aegolius funereus</i>	1.96 per square mile	3	3	3	4	3	3	3

<sup>a</sup> Sources: Shook and Ritchie, 2008; Benson, 2001.

<sup>b</sup> Estimate based on stick nest survey data and regional densities for the northern saw-whet owl and the boreal owl multiplied by the area of the 200-foot right-of-way, terminal reserve, stream relocation and road relocation areas (Benson, 2001).

<sup>c</sup> Number of nests impacted by disturbance is based on nests identified within 0.5 mile of alternatives.



**Table E-8**  
**Birds of Conservation Concern Estimated Nesting Habitat Loss Impacts from Alternatives<sup>a,b</sup>**  
 (page 1 of 4)

<b>Species (Migration)<sup>c</sup></b>	<b>Rationale</b>	<b>SEA Estimated Study Area Population<sup>d</sup></b>	<b>Habitat Impact Description</b>	<b>Estimated Average Project Impact (No. Birds)<sup>e</sup></b>	<b>Estimated Minimum Project Impact (No. Birds)<sup>f</sup></b>	<b>Estimated Maximum Project Impact (No. Birds)<sup>g</sup></b>
American Three-toed Woodpecker (R)	Sensitive to forest management - cavity nester	571	155 to 608 acres evergreen and mixed forest	4	4	5
Arctic Tern (L)	Long-term declines, sensitive to disturbance	Unknown	43 to 178 acres emergent wetlands	✓	✓	✓
Bald Eagle (S)	Sensitive to disturbance, contaminants	30	Disturbance to 1 to 6 nest trees	4	2	12
Bank Swallow (L)	Long-term declines	8,567	Bluff nesting habitat loss/disturbance, 44 to 272 acres agricultural and emergent wetlands	1	1	1
Belted Kingfisher (S)	Long-term declines	400	Riparian habitat loss, 11 to 53 acres shrub/scrub habitat	✓	✓	✓
<b>Blackpoll Warbler (L)</b>	Population declines, sensitive to changes in riparian habitats	11,422	Riparian habitat loss, 62 to 253 acres shrub/scrub and woody wetlands	35	30	43
Boreal Chickadee (R)	Sensitive to forest management - cavity nester	3,141	221 to 608 acres evergreen and mixed forests	3	2	3
Brown Creeper (R)	Sensitive to forest management - cavity nester	143	272 to 899 acres evergreen and mixed forests, woody wetlands	✓	✓	✓
Cliff Swallow (L)	Long-term Alaska declines	4,854	Bluff nesting habitat loss/disturbance, 44 to 272 acres agricultural and emergent wetlands	2	1	2
Common Loon (S)	Sensitive to disturbance, contaminants	657	Disturbance to nesting lakes, aquatic habitat degradation	1	1	2
Dark-eyed Junco (S)	Widespread long-term population declines	114,220	232 to 661 acres evergreen and mixed forest and shrub/scrub wetlands	90	76	111

**Table E-8**  
**Birds of Conservation Concern Estimated Nesting Habitat Loss Impacts from Alternatives<sup>a,b</sup>**  
 (page 2 of 4)

<b>Species (Migration)<sup>c</sup></b>	<b>Rationale</b>	<b>Estimated Study Area Population<sup>d</sup></b>	<b>Habitat Impact Description</b>	<b>Estimated Average Project Impact (No. Birds)<sup>e</sup></b>	<b>Estimated Minimum Project Impact (No. Birds)<sup>f</sup></b>	<b>Estimated Maximum Project Impact (No. Birds)<sup>g</sup></b>
Golden-crowned Kinglet (S)	Sensitive to forest management - canopy nester	485	67 to 154 acres evergreen forest	0	0	1
Great Gray Owl (S)	Sensitive to forest management - canopy nester	7	496 to 1,364 acres forests and wetlands	2	0	4
Great Horned Owl (S)	Sensitive to forest management - canopy nester	7	434 to 1,168 acres forest and woody wetlands	2	0	4
Hairy Woodpecker (R)	Sensitive to forest management - cavity nester	343	67 to 154 acres evergreen forest	2	2	3
Hermit Thrush (S)	Long-term declines	3,712	78 to 207 acres evergreen forest and shrub/scrub wetlands	3	2	3
Horned Grebe (S)	Long-term range contraction	Unknown	Disturbance to nesting lakes, 43 to 178 acres emergent wetlands	✓	✓	✓
Lesser Yellowlegs (L)	Boreal forest habitat loss, alteration	Unknown	180 to 550 evergreen forest and wetlands	9	8	11
Long-tailed Duck (S)	Significant long-term declines	119	Disturbance to nesting lakes, 113 to 396 acres wetlands	✓	✓	✓
Murrelet species (S)	Significant long-term declines, marbled murrelet sensitive to forest management	Unknown	67 to 154 acres evergreen forest	✓	✓	✓
Merlin (L)	Sensitive to contaminants, habitat loss	Unknown	496 to 1,364 acres of forest and wetlands	✓	✓	✓
Northern Flicker (S)	Sensitive to forest management - cavity nester	514	221 to 608 acres evergreen and mixed forest	✓	✓	✓
Northern Harrier (L)	Wetland and grassland habitat loss, in decline	Unknown	114 to 490 acres agricultural and wetlands	✓	✓	✓

**Table E-8**  
**Birds of Conservation Concern Estimated Nesting Habitat Loss Impacts from Alternatives<sup>a,b</sup>**  
 (page 3 of 4)

<b>Species (Migration)<sup>c</sup></b>	<b>Rationale</b>	<b>Estimated Study Area Population<sup>d</sup></b>	<b>Habitat Impact Description</b>	<b>Estimated Average Project Impact (No. Birds)<sup>e</sup></b>	<b>Estimated Minimum Project Impact (No. Birds)<sup>f</sup></b>	<b>Estimated Maximum Project Impact (No. Birds)<sup>g</sup></b>
<i>Olive-sided Flycatcher</i> (L)	Long-term decline, sensitive to forest management - canopy nester	571	221 to 608 acres evergreen and mixed forests	15	13	18
Osprey (L)	Sensitive to disturbance, contaminants	7	Disturbance to 0 to 1 nest tree	2	0	2
Pacific Loon (S)	Sensitive to disturbance, contaminants	390	Disturbance to nesting lakes, aquatic habitat degradation	✓	✓	✓
Pine Siskin (S)	Long-term declines, sensitive to forest management - canopy nester	1,428	221 to 608 acres evergreen and mixed forests	17	14	21
Red-breasted Nuthatch (R)	Sensitive to forest management - cavity nester	314	221 to 608 acres evergreen and mixed forests	✓	✓	✓
Red-necked Grebe (S)	Long-term declines, sensitive to disturbance	Unknown	Disturbance to nesting lakes, 43 to 178 acres emergent wetlands	✓	✓	✓
Red-tailed Hawk (L)	Sensitive to contaminants, habitat loss	44	91 to 417 open forest, woodland, shrub/scrub and woody wetland	6	0	12
Red-throated Loon (L)	Sensitive to disturbance, contaminants	11	Disturbance to nesting lakes, aquatic habitat degradation	✓	✓	✓
Rusty Blackbird (S)	Long-term decline, sensitive to climate and riparian habitat changes	1,142	334 to 1,004 acres evergreen and mixed forest, and wetlands	2	1	2
Sharp-shinned Hawk (L)	Sensitive to contaminants, habitat loss	Unknown	91 to 417 open forest, woodland, shrub/scrub and woody wetland	✓	✓	✓
Solitary Sandpiper (L)	Long-term declines, sensitive to changes in boreal wetlands	Unknown	68 to 520 acres woodlands, wetlands, agricultural	1	1	1
Surf Scoter (S)	Significant long-term declines	1,175 (scoter)	129 to 426 acres woodlands and wetlands	3	2	3

**Table E-8**  
**Birds of Conservation Concern Estimated Nesting Habitat Loss Impacts from Alternatives<sup>a,b</sup>**  
 (page 4 of 4)

Species (Migration) <sup>c</sup>	Rationale	Estimated Study Area Population <sup>d</sup>	Habitat Impact Description	Estimated Average Project Impact (No. Birds) <sup>e</sup>	Estimated Minimum Project Impact (No. Birds) <sup>f</sup>	Estimated Maximum Project Impact (No. Birds) <sup>g</sup>
<i>Townsend's Warbler</i> (L)	Sensitive to forest management - canopy nester	4,283	221 to 608 acres evergreen and mixed forest	✓	✓	✓
Varied Thrush (S)	Sensitive to forest management - canopy nester	17,133	383 to 968 acres forest	12	10	15
Violet-green Swallow (L)	Long-term Alaska declines	2,284	122 to 448 acres open forest and woodlands, emergent and woody wetlands	10	8	12
White-crowned Sparrow (L)	Long-term Alaska declines	37,122	200 acres low shrub and graminoid habitats removed, fragmented	26	22	32
White-winged Crossbill (R)	Sensitive to forest management - canopy nester	5,711	221 to 608 acres evergreen and mixed forests	10	9	13
White-winged Scoter (S)	Significant long-term declines	1,175 (scoter)	129 to 426 acres woodlands and wetlands	3	2	3
Wilson's Warbler (L)	Sensitive to changes in riparian habitats	19,989	165 to 507 acres mixed forest and shrub/scrub wetlands	6	5	7
<b>Total Estimated Birds Impacted</b>				<b>271</b>	<b>216</b>	<b>346</b>

<sup>a</sup> Sources: Rosenberg, 2004; ADF&G, 2006; Shook and Ritchie, 2008; Sauer *et al.*, 2008; Platte *et al.*, 2008; URS, 2006; ADF&G, 1998; USFWS, 2008.

<sup>b</sup> Number of nesting birds impacted is based on the SEA estimated project area nesting density multiplied by either the alternative length for linear densities or by the 200-foot right-of-way, terminal reserve, stream relocation and road relocation areas for the average, minimum and maximum alternatives.

<sup>c</sup> (R) = Resident; (S) = Short-distance migrant; (L) = Long-distance migrant; ✓ indicates the species has been documented in the project area and impacts would occur but data are insufficient to estimate the scale of impact. Bold-italics indicates ADF&G Species of Special Concern (ADF&G, 1998).

<sup>d</sup> SEA estimates generated only for species with an abundance estimate within the project area.

<sup>e</sup> Average of eight proposed alternatives. Does not represent an alternative.

<sup>f</sup> Minimum value for eight proposed alternatives.

<sup>g</sup> Maximum value for eight proposed alternatives.

**Table E-9**  
**Proposed Port MacKenzie Rail Extension Project Area Habitat Patch and Core Area Statistics<sup>a,b,c</sup>**

	Habitat									
	Evergreen Forest	Deciduous Forest	Mixed Forest	Emergent Wetlands	Shrub/Scrub	Woody Wetlands	Agriculture	Barren Land	Open Water	All Classes
<b>Project Area Habitat Patches</b>										
Area (hectares)	26,852	37,825	39,394	28,506	5,497	33,427	4,935	1,800	23,294	207,925
Number	18,016	27,868	41,637	23,654	9,414	24,822	784	1,179	15,751	151,895
Mean Size (hectares)	1.5	1.4	0.9	1.2	0.6	1.3	6.3	1.5	14.8	1.4
Mean Edge (meters)	560	507	456	457	348	528	805	565	1,293	500
Shape Index	1.45	1.39	1.41	1.38	1.36	1.40	1.47	1.45	1.47	1.40
<b>Core Areas for Habitat Patches Larger than 40 hectares</b>										
Area (hectares)	7,628	11,408	6,575	9,207	464	9,091	3,563	528	18,305	68,992
Number	6,154	7,582	10,879	5,254	1,332	7,201	258	353	1,054	41,317
Mean Size (hectares)	1.2	1.5	0.6	1.8	0.3	1.3	13.8	1.5	17.4	1.7
Mean Edge (meters)	395	457	277	419	218	411	961	465	1,060	394
Shape Index	1.71	1.72	1.67	1.70	1.67	1.71	1.74	1.72	1.71	1.70
<b>Core Habitats Crossed by Proposed Rail Line Segments</b>										
Area (hectares)	579	449	312	957	0	679	3,367	0	0	6,361
Number	21	53	49	13	0	32	5	0	0	182
Mean Size (hectares)	27.5	8.5	6.4	73.6	0	21.2	673.5	0	0	35.0
Mean Edge (meters)	3,741	1,784	1,516	8,622	0	3,967	33,340	0	0	3,622
Shape Index	2.25	2.03	1.98	2.67	0	2.45	3.53	0	0	2.19

<sup>a</sup> Source: Homer *et al.*, 2004.

<sup>b</sup> To convert hectares to acres, multiply by 2.471; to convert meters to feet, multiply by 3.2808.

<sup>c</sup> Number = number of core areas crossed; area = total size of core areas.

**Table E-10**  
**Statistics for Core Area Habitats Larger than 100 Acres the Proposed Port MacKenzie Rail Extension Alternatives would Cross<sup>a</sup>**

Habitat	Alternative <sup>b</sup>															
	Mac West-Connector 1-Willow		Mac West-Connector 1-Houston North		Mac West-Connector 1-Houston South		Mac West-Connector 2-Big Lake		Mac East-Connector 3-Willow		Mac East-Connector 3-Houston North		Mac East-Connector 3-Houston South		Mac East-Big Lake	
	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area
Wildlife Habitats																
Evergreen Forest	10	290	5	104	5	104	6	139	10	336	5	150	5	150	5	91
Deciduous Forest	30	201	19	46	19	46	12	203	30	201	19	46	19	46	12	203
Mixed Forest	37	173	2	0	2	0	11	222	46	258	11	86	11	86	13	99
Emergent Wetland	0	0	10	353	7	622	0	0	0	0	10	353	7	622	0	0
Shrub/Scrub Wetland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woody Wetland	12	489	21	546	20	527	10	501	4	288	13	345	12	326	4	305
Agriculture	3	2,857	3	2,857	3	2,857	4	3,367	1	1,127	1	1,127	1	1,127	0	0
Forests	77	663	26	150	26	150	29	564	86	795	35	282	35	282	30	393
Wetland	12	489	31	899	27	1,149	10	501	4	288	23	697	19	947	4	305
Forest and Wetland	89	1,152	57	1,049	53	1,299	39	1,065	90	1,083	58	979	54	1,229	34	698

<sup>a</sup> Source: Homer *et al.*, 2004.

<sup>b</sup> No. = number of core areas crossed; area = total size of core areas in hectares. To convert hectares to acres, multiply by 2.471.

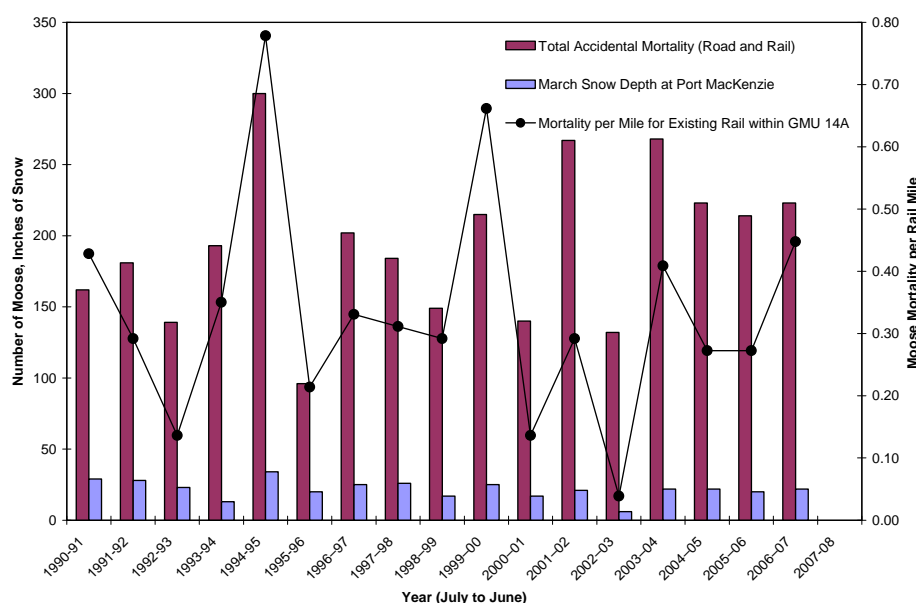
<sup>a</sup> Source: Homer *et al.*, 2004.

<sup>b</sup> No. = number of core areas crossed; area = total size of core areas in hectares. To convert hectares to acres, multiply by 2.471.

## E.2.3 Moose-Train Collision Mortality

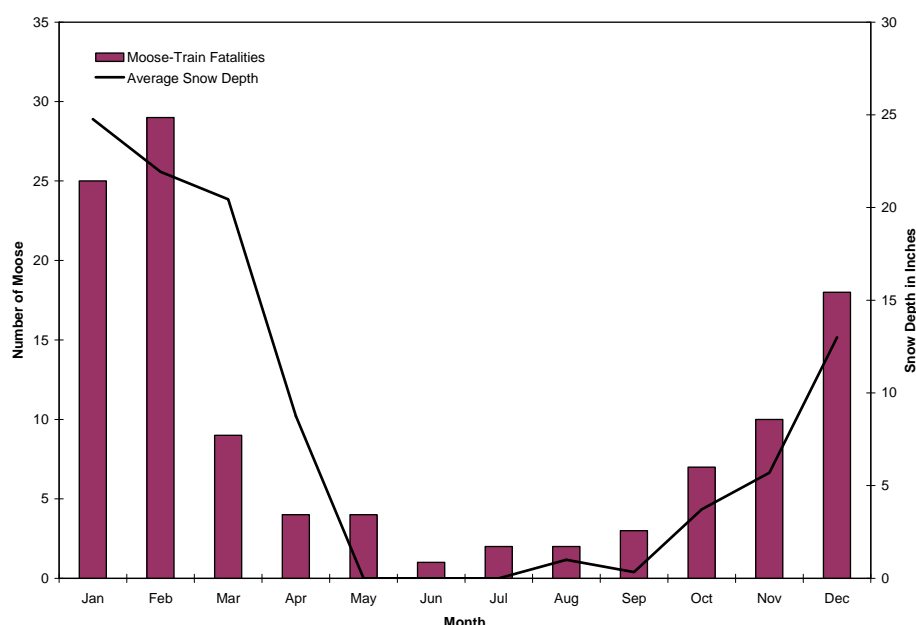
This section provides information used by SEA to calculate and assess moose-train collision mortality summarized in Chapter 5. Rail collision mortality for moose was estimated based on the reported annual mortality for moose from the existing 51.4 miles of rail line running through Subunit 14A (Figure E-7). The existing 51.4 miles of rail line through Subunit 14A averages a reported annual moose-train collision mortality of 0.33 moose per mile, or about 17 moose per year (range 0.14 to 0.78 moose per mile; McDonough, 2002b; Del Frate, 2004; Peltier, 2006a). Moose-train collision mortality accounts for an average of 9 percent of accidental moose mortality, and accidental mortality (road and train collisions) accounts for an average of 25 percent of total accidental and harvest mortality for moose in Subunit 14A (McDonough, 2002b; Del Frate, 2004; Peltier, 2006a).

The frequency of trains along the proposed rail line would be 24 percent lower than the frequency of trains on the existing 51.4-mile rail line in the project area. Estimated moose-train collision mortality from operation of the proposed 33- to 47-mile rail line would average 3 to 4 moose per year, ranging from 1 to 9 collision mortalities per year. The frequency of trains would be increased on the existing rail line because of operation of the proposed rail line extension from an average of 8.5 trains per day to an average of 10.5 trains per day. The number of moose-train collision mortalities would then be expected to increase by 20 percent, or about 3 moose per year on the existing line from 17 moose per year to 20 moose per year (range 0.17 to 0.94 moose per mile, or 2 to 8 moose per year). Combined direct and indirect moose-train collision mortality as a result of the proposed rail line would then average 6 to 7 moose per year, ranging from 3 to 17 moose per year.



**Figure E-7. Reported Annual Moose-Train Collision Mortality for 51.4 miles of Existing Rail Line in Subunit 14A in the Proposed Port MacKenzie Rail Extension Study Area with February Snow Depth at the Point MacKenzie Station (McDonough, 2002b; Del Frate, 2004; Peltier, 2006a; NRCS, 2008)**

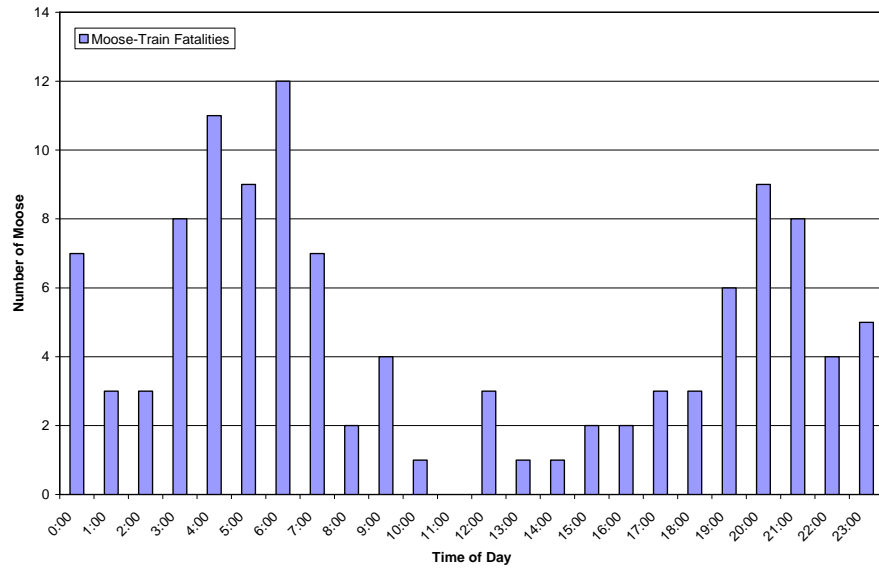
Most train moose kills along the existing rail line in the lower Susitna Valley occur during January, February, and March (Modafferi, 1991). Most (72 percent) moose-train kills along the existing rail line in Subunit 14A occurred during January, February, November, and December (ADF&G, 2008c; Figure E-8), when the frequency of trains averages 5 trains per day compared to the 10 to 12 trains per day during May to October. Collision mortality along the stretch of track in Subunit 14A appears to be influenced by February snow depth at the Point MacKenzie snow course (NRCS, 2008) (Figure E-7). Moose-train collision mortalities resulting from proposed rail line operations could range higher than the estimated values during years with snow depths greater than 34 inches, or if a greater proportion of seasonal moose movements occur across the alternatives than occurs across the existing 51.4-mile rail line in the study area.



**Figure E-8. Moose-Train Collision Mortality by Month for 51.4 miles of Existing Rail Line in Subunit 14A in the Proposed Port MacKenzie Rail Extension Project Area with Average Snow Depth at the Wasilla or Point MacKenzie Stations, 2000 to 2008 (ADF&G, 2008b; NRCS, 2008)**

Moose-train collisions on the existing rail line occurred throughout the day with a bimodal pattern of increased mortality from 3:00 to 7:00 and 19:00 to 0:00 (Figure E-9). Because of the extreme seasonal changes in daylight hours, most collisions occurred during darkness (69 percent), followed by daylight hours (16 percent), and twilight hours at dawn and dusk (15 percent) (ADF&G, 2008b). Meat from about 40 percent of moose-train collision mortalities was salvaged for human consumption (ADF&G, 2008b).





**Figure E-9. Moose-Train Collision Mortality by Hour for 51.4 miles of Existing Rail Line in Subunit 14A in the Proposed Port MacKenzie Rail Extension Study Area, 2000 to 2008 (ADF&G, 2008b)**

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## **APPENDIX F**

### **FISHERIES RESOURCES**

## **F. FISHERIES RESOURCES**

The Surface Transportation Board Section of Environmental Analysis (SEA) based the analysis of affects to fisheries from the proposed Port MacKenzie Rail Extension on habitat use, habitat requirements, and seasonal movement of fish within the project area. SEA based the habitat analysis on the stream crossings described in Chapter 4, anadromous fish stream data (Johnson and Daigneault, 2008), fish occurrence and habitat data (ADF&G, 2009a), and data collected by SEA at proposed crossing sites in summer 2008 (Noel *et al.*, 2008). The proposed project alternatives would cross drainages important for fisheries in the upper Cook Inlet – the Willow Creek, Rolly Creek, and Fish Creek (tributaries of the Susitna River); the Little Susitna River drainage; the Big Lake drainage, the Goose Creek drainage, and drainages in east Susitna Flats (see Section 4.2). These drainages support between one and five species of Pacific salmon, as described in Section 5.4. This appendix provides additional information and analyses supporting the information and analysis in Section 5.4.

### **F.1 Recreational Fisheries**

The Alaska Department of Fish and Game (ADF&G) Sport Fish Division manages recreational fisheries in the project area. The proposed Port MacKenzie Rail Extension would lie within the northern Cook Inlet sport fish management area (Figure F-1), which includes all freshwater drainages and adjacent marine waters of Upper Cook Inlet between the southern tip of Chisak Island and the Eklutna River, excluding the upper Susitna River drainage. The project alternatives could affect important recreational fish streams, including the Little Susitna River, Fish Creek, Willow Creek, Rodgers Creek, Lake Creek, Goose Creek, Lucile Creek, Little Meadow Creek, and several unnamed tributary streams (Sweet *et al.*, 2003). Sport anglers fish in the management area for salmon – Chinook, chum, coho, pink and sockeye; rainbow trout, Dolly Varden, Arctic char, Arctic grayling, lake trout, northern pike, whitefish, and eulachon (Table F-1). Upper Cook Inlet fisheries have been the focus of allocation disputes between commercial, subsistence, and sport fishing interests for many years. Commercial fishing of these stocks takes place in Cook Inlet waters. About 60 percent of the Alaska's population lives within or next to the management area and recreational fishing is an important year-round activity (Sweet *et al.*, 2003). Parks Highway, secondary roads from Port MacKenzie to the town of Willow, navigable waters, and overland trail systems provide access to fisheries resources in the project area.

Sport angling opportunities are available year-round. Summer fishing activity coincides with the return of salmon to the area, and most sport fishing takes place along the accessible stream reaches near Parks Highway or on the larger navigable rivers and streams. During winter, anglers fish through the ice, primarily on stocked lakes with rainbow trout, Arctic grayling, Arctic char, and landlocked Chinook and coho salmon. There are also wild stocks of rainbow trout, Dolly Varden, Arctic grayling, northern pike, burbot, Arctic char, and lake trout. Figures F-2 and F-3 depict the estimated sport fishing harvest by species and fishing effort for area lakes and streams (ADF&G, 2009c). Total fishing effort on area lakes (24,000 days) was about 36 percent of the fishing effort on area streams and rivers (67,000 days) during 2007 (ADF&G, 2009c). Total harvest for rainbow trout (approximately 5,600 fish) and northern pike

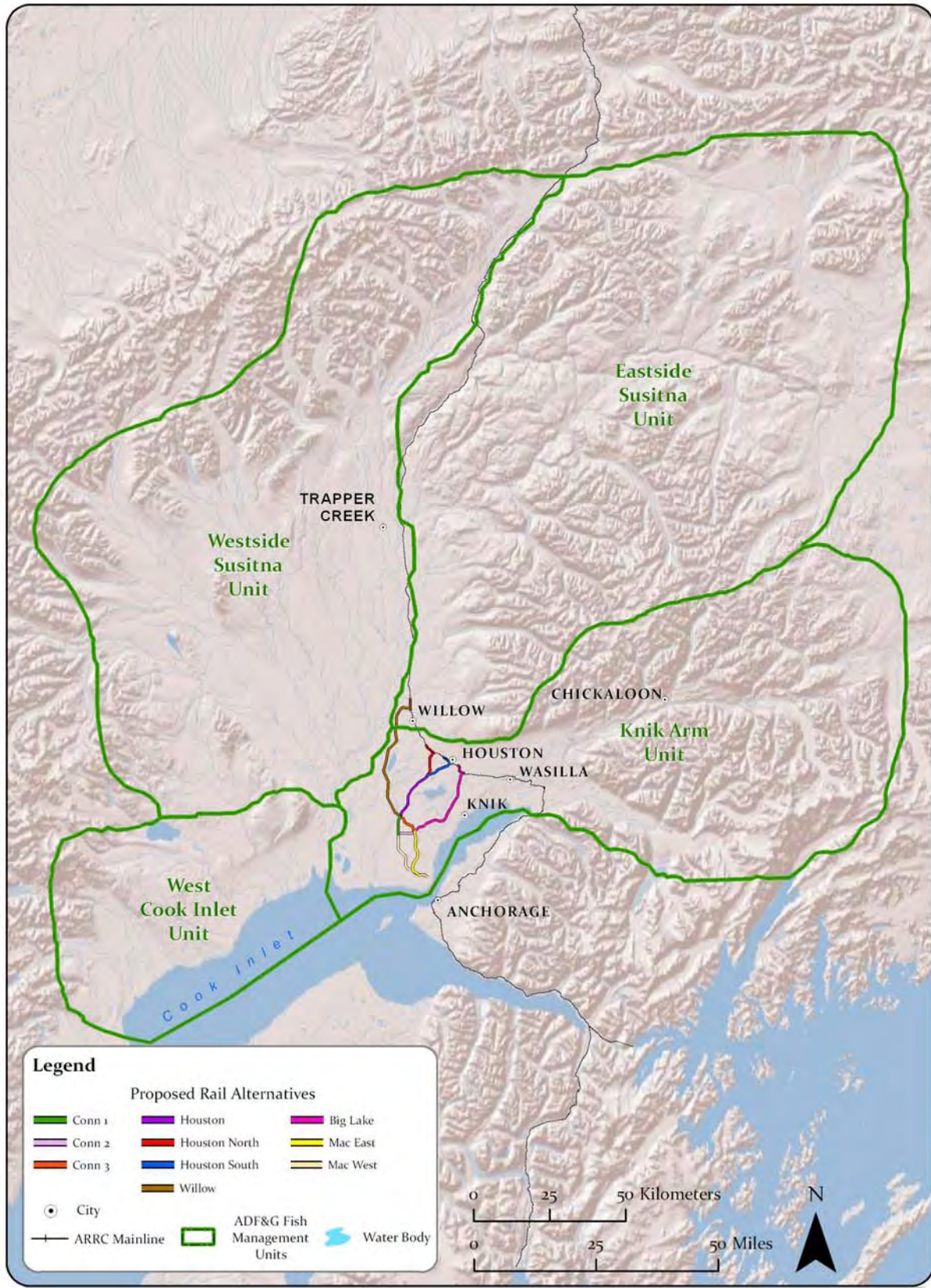


Figure F-1. Upper Cook Inlet Sport Fish Management Area (ADF&G, 2009b)



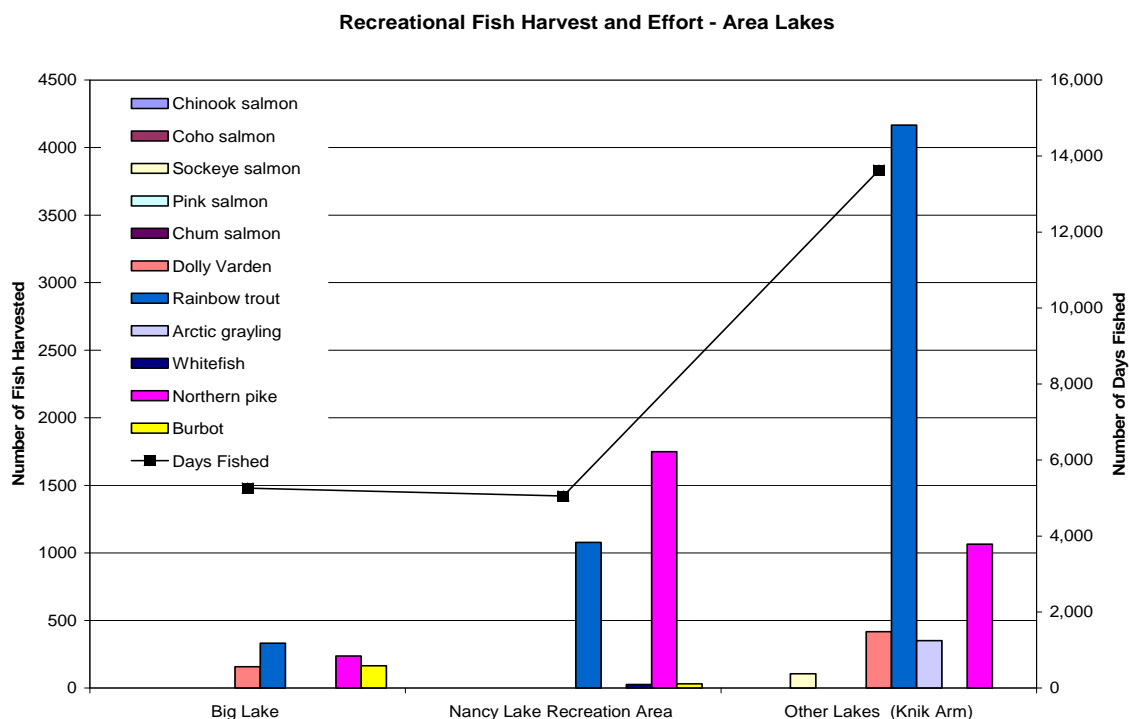
**Table F-1**  
**Habitat and Ecology of Important Commercial, Recreational, Subsistence and Personal Use Fish<sup>a</sup>**  
 (page 1 of 2)

<b>Common Name (Species)</b>	<b>Spawning Habitats/ Rearing Habitats</b>	<b>Overwinter Habitats</b>	<b>Ecology</b>
Arctic Char ( <i>Salvelinus alpinus</i> )	Spawn over steep, broken substrates or gravel shoals August to October. Rear in lakes.	Overwinter in lakes.	Little known about life history in lakes. Reach maturity at about age 6 to 9. Often exist in dwarf and normal forms in the same lake.
Arctic Grayling ( <i>Thymallus arcticus</i> )	Cool, clear, small headwater streams with gravelly substrate, might travel up to 100 miles, move little during summer feeding season; feed on drifting aquatic insects, salmon eggs, outmigrating salmon smolts and terrestrial insects; juveniles and subadults move between overwintering grounds in larger rivers to feeding grounds in clearwater tributaries.	Overwinter in lakes, and in the lower reaches and deeper pools of Willow Creek and the Little Susitna River.	Highly migratory within a river system using different tributaries for spawning, juvenile rearing, summer feeding, and overwintering. Might travel up to 100 miles to spawning streams; after ice breakup, migrate to summer feeding areas and spawning grounds. Spawn at about age 4 or 5, 11 to 12 inches long, and generally return to the same spawning and feeding areas each year
Burbot ( <i>Lota lota</i> )	Spawn under the ice in late February to March. Young feed on insects and other invertebrates, larger subadults and adults feed on whitefish, sculpins, and lampreys.	Overwinter in lakes or in deeper pools along rocky outcroppings or bluffs in larger rivers.	Nocturnal, long-lived, and slow-growing; sexually mature at 8 years, 18 inches. Harvest is restricted in lakes as populations have declined.
Chinook Salmon ( <i>Oncorhynchus tshawytscha</i> )	Spawn in fast deep water over gravelly or rocky bottoms of clearwater streams where they can dig redds; fry and juveniles use sloughs, backwaters, tributaries, shallows along gravel bars and beaver ponds.	Overwinter as eggs or juveniles. Can be found in Willow Creek and the Little Susitna River.	Juveniles smolt and outmigrate in spring following hatching, and outmigration appears to occur soon after ice breakup, peaking in mid to late May. Extensive movement within the river system in the first year of life, adults return to spawn after 4- to 5-year marine residence.
Chum Salmon ( <i>Oncorhynchus keta</i> )	Spawn in small side channels and areas of larger rivers with upwelling springs; fry emerge from the gravel in spring and immediately outmigrate downriver, feeding on small insects and other detritus.	Overwinter as eggs.	Fry emerge from the gravel in early to mid April, with peak outmigration before the end of May. Adults return to spawn after 3- to 5-year marine residence (adults infrequently found in study area).
Coho Salmon ( <i>Oncorhynchus kisutch</i> )	Spawn in gravel areas of clearwater habitats, usually spring-fed; juveniles use ponds, lakes, and pools in streams and rivers or stream margins, usually among submerged woody debris and in scour pools.	Juveniles overwinter near springs and in spring-fed streams; areas with upwelling are important for both egg and fry survival.	Spend 1 to 3 years in streams, spend 1 year in marine waters before returning. Sizeable run in the Little Susitna River.

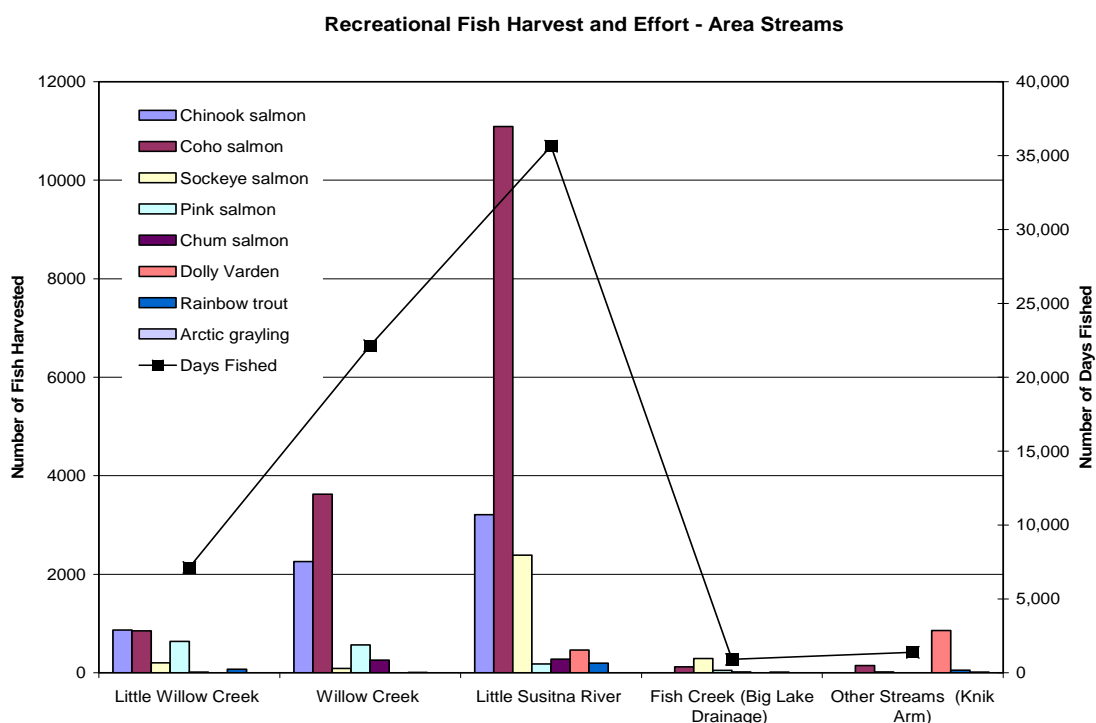
**Table F-1**  
**Habitat and Ecology of Important Commercial, Recreational, Subsistence and Personal Use Fish<sup>a</sup>**  
 (page 2 of 2)

<b>Common Name (Species)</b>	<b>Spawning Habitats/ Rearing Habitats</b>	<b>Overwinter Habitats</b>	<b>Ecology</b>
Dolly Varden ( <i>Salvelinus malma</i> )	Spawn from late September to October in streams with gravel; juveniles rear in streams, remaining under rocks, logs, or undercut banks and feeding from the stream bottom.	Overwinter in lakes, migrate to different river systems to find overwintering habitat.	Anadromous and freshwater populations. Eggs hatch in March and fry emerge as late as June, mature at 5 to 9 years, with 3 to 4 summers marine residence, about 16 to 24 inches.
Eulachon – smelt ( <i>Thaleichthys pacificus</i> )	Spawn in lower reaches of streams, hatch in fresh water and grow to maturity in the marine environment feeding on “krill.”	Not in fresh water.	Eggs hatch in 21 to 40 days, current carries them to the marine environment. Adults return in 3 to 4 years. Adults die after spawning.
Lake Trout ( <i>Salvelinus namaycush</i> )	Spawn September through November over shallow rocky shoals, clean, rocky lake bottom; eggs hatch in spring; feed on phytoplankton.	Overwinter in deep lakes.	Deep, oligotrophic mountain lakes; mature and spawn for the first time at approximately 7 or 8 years and after that, spawn every other year or even less frequently; live to about 20 but can live up to 40 years.
Northern Pike ( <i>Esox lucius</i> )	Spawn in marshy, grassy banks with no little or no current; young pike emerge and begin to feed on insects and small crustaceans, quickly beginning to feed on smaller fish.	Believed to overwinter in the deep slow waters of larger rivers and in deeper lakes.	Not believed to travel long distances. Found in large and small lakes and tributaries to the Susitna River and the Little Susitna River, Big Lake, and Fish Creek.
Pink Salmon ( <i>Oncorhynchus gorbuscha</i> )	Spawn in the lower reaches of freshwater streams in shallow riffles over coarse gravel; eggs hatch midwinter in the gravel and emerge in late winter to migrate to marine waters.	Eggs in the gravel until spring; do not overwinter as juveniles in Southcentral Alaska.	Two-year cycle that is stronger on even years; can be found in most area streams during summer migration.
Rainbow Trout ( <i>Oncorhynchus mykiss</i> )	Spawn in late winter and early spring on shallow gravel riffles in clearwater streams when fish are about 6 to 7 years. Eggs hatch in 1 to 4 months. Juveniles rear along protected lake shores and stream banks.	Overwinter in larger lakes and deeper pools.	Rainbow trout occur as both freshwater resident and sea-run races known as steelhead trout. Rainbows in this area are wild stocks as well as hatchery fish.
Sockeye salmon ( <i>Oncorhynchus nerka</i> )	Usually spawn in rivers and streams and upwelling areas along lake beaches. Eggs hatch during winter and young emerge and move into rearing areas along lakes and streams.	Juveniles use deeper large lakes for overwintering.	In stream systems with large lakes; spawning in streams and rivers, will occur in backwater sloughs or oxbows. The Fish Creek-Big Lake drainage has a moderate run of sockeye salmon.

<sup>a</sup> Source: ADF&G, 2007a; 2007b; 2009a; Mecklenburg *et al.*, 2002.



**Figure F-2. Recreational Fish Harvest and Effort for Area Lakes during 2007 (ADF&G, 2009c)**



**Figure F-3. Recreational Fish Harvest and Effort for Area Streams during 2007 (ADF&G, 2009c)**

(approximately 3,000 fish) in area lakes was about 39 percent of the total harvest for coho salmon (approximately 15,800 fish) and Chinook salmon (approximately 6,300 fish) in area streams during 2007 (ADF&G, 2009c).

## **F.2 Commercial Fisheries**

The ADF&G Division of Commercial Fisheries manages commercial, subsistence, and personal-use fisheries. The Division of Commercial Fisheries manages the Upper Cook Inlet commercial fishing district to provide fishing opportunities to the commercial drift gillnet fleet and set gillnets along the shore line. The Upper Cook Inlet management district includes the area north of Anchorage Point, and is divided into the Central and Northern Districts (Figure F-4). The Northern District includes marine waters in three subdistricts that are within proposed Port MacKenzie Rail Extension study area – Subdistrict 247-41 Susitna Flats, Subdistrict 247-42 Point MacKenzie, and Subdistrict 247-50 Knik (Figure F-4). All five Pacific salmon, razor clams (*Siliqua patula*), Pacific herring (*Clupea pallasii*), and eulachon or smelt are commercially harvested in the Upper Cook Inlet (ADF&G, 2007b).

Since the inception of the first commercial salmon fishery in 1882, many gear types, including fish traps, gillnets, and seines have been used with varying degrees of success to harvest salmon in the Upper Cook Inlet. At present, (fixed) gill nets are used for harvest in the Northern District. Typically, the Upper Cook Inlet salmon harvest is about 5 percent of the statewide commercial salmon harvest, and is harvested by nearly 10 percent of all holders of statewide salmon permits (Shields, 2007). The commercial salmon harvest in Upper Cook Inlet has ranged from 1.8 to 5.7 million fish, primarily sockeye salmon, with a 10-year average of 3.5 million salmon per year (Table F-2). In the study area, the salmon harvest in 2007 in Subdistricts 247-41, 247-42, and 257-50 represented less than 1 percent of the Upper Cook Inlet harvest (Shields, 2007).

Chinook salmon stocks in late May are the earliest run of salmonids that provide Upper Cook Inlet commercial fishing opportunity. As the season progresses, sockeye, chum, and coho salmon also become available to commercial fisheries, and commercial fishing continues throughout summer. The ADF&G monitors salmon stocks returning to index streams in the study area for salmon escapement (adult salmon returning to spawning grounds – or those that have “escaped” harvest) to ensure sustainability of salmon stocks (Table F-3).

The Susitna River is the largest salmon-producing stream in the North of the District. Proposed rail extension alternatives would cross four tributaries to the main-stem Susitna River – Rodgers Creek (a tributary to Little Willow Creek), Willow Creek, Rolly Creek (upstream from anadromous fish use (Johnson and Daigneault, 2008), and Fish Creek. Salmon stocks from the Susitna River and its tributaries are an important component of commercial fishery in Northern Cook Inlet, although the contribution of Little Willow Creek, Willow Creek, Rodgers Creek, and Fish Creek stocks to the Susitna River salmon stocks is not known (Tobias and Willette, 2008).

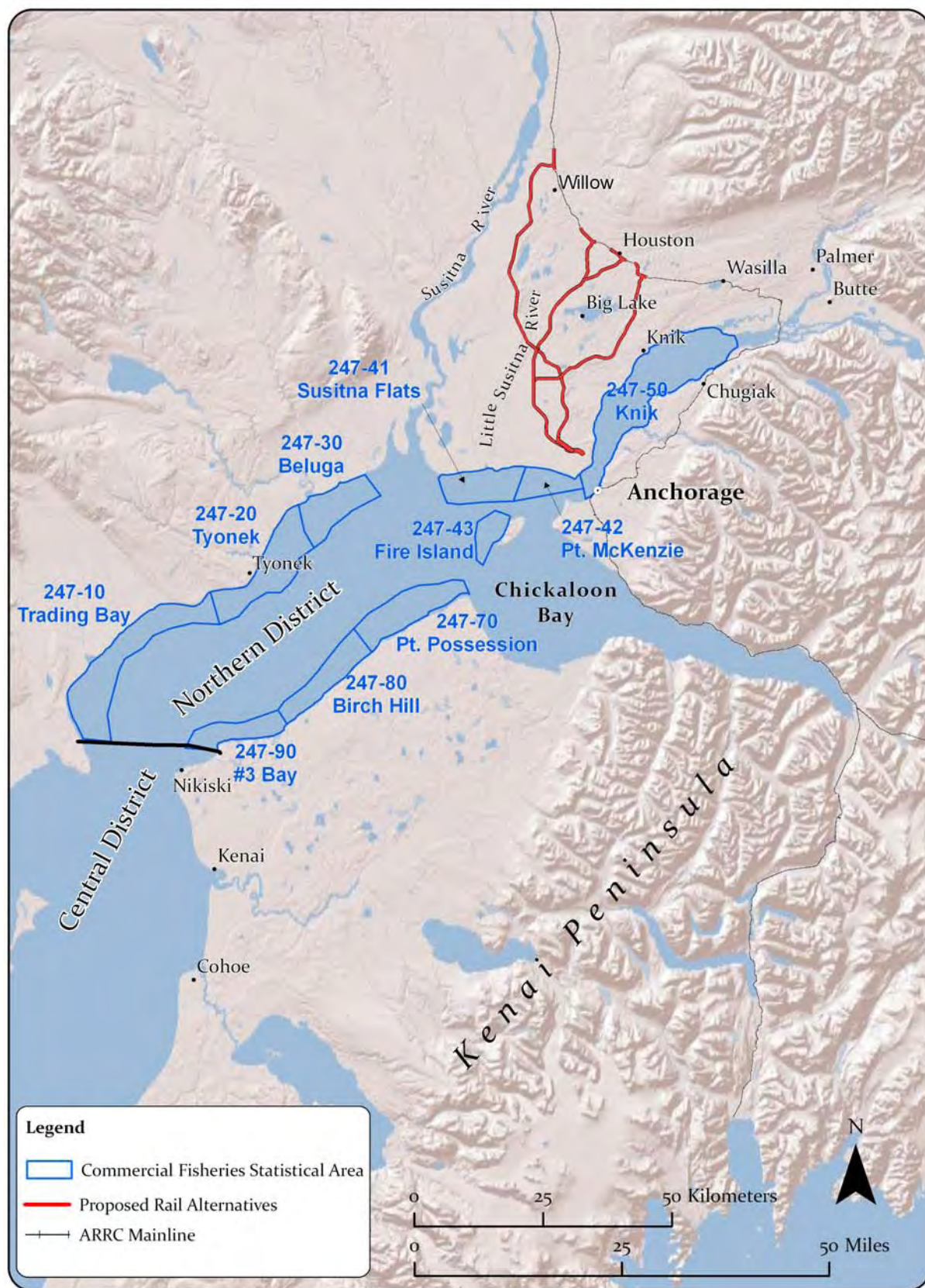


Figure F-4. Upper Cook Inlet Commercial Fisheries Districts and Subdistricts (Shields, 2007)

**Table F-2**  
**Upper Cook Inlet Commercial Salmon Harvest 1997 to 2007<sup>a</sup>**

<b>Year</b>	<b>Chinook</b>	<b>Sockeye</b>	<b>Coho</b>	<b>Pink</b>	<b>Chum</b>	<b>Total</b>
1997	13,292	4,176,738	152,404	70,933	103,036	4,516,403
1998	8,124	1,219,242	160,660	551,260	95,654	2,034,940
1999	14,383	2,680,510	125,908	16,174	174,541	3,011,516
2000	7,350	1,322,482	236,871	146,482	127,069	1,840,254
2001	9,295	1,826,833	113,311	72,559	84,494	2,106,492
2002	12,714	2,773,118	246,281	446,960	237,949	3,717,022
2003	18,490	3,476,159	101,756	48,789	120,767	3,765,961
2004	27,476	4,926,220	311,056	357,939	146,164	5,768,855
2005	28,171	5,238,168	224,657	48,419	69,740	5,609,155
2006	18,029	2,192,730	177,853	404,111	64,033	2,856,756
2007	17,625	3,316,779	177,339	147,020	77,240	3,736,003
Average, 1997 – 2006	15,732	2,983,220	185,076	216,363	122,345	3,522,736

<sup>a</sup> Source: Shields, 2007.

**Table F-3**  
**Salmon Escapement in Index Streams in the Port MacKenzie Rail Extension Study Area<sup>a</sup>**

<b>System</b>	<b>Sustainable Escapement Goals</b>		<b>Escapements</b>			
	<b>Data Source</b>	<b>Range</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
<b>Chinook Salmon</b>						
The Little Susitna River	Single aerial survey index	900 to 1,800	1,694	2,095	1,855	1,731
Little Willow Creek	Single aerial survey index	450 to 1,800	2,227	1,784	816	1,103
Willow Creek <sup>b</sup>	Single aerial survey index	1,600 to 2,800	2,985	2,463	2,217	1,373
<b>Coho Salmon</b>						
The Little Susitna River	Weir <sup>c</sup>	10,100 to 17,700	40,199	16,839	8,786	17,573
<b>Sockeye Salmon</b>						
Fish Creek (Big Lake)	Weir	20,000 to 70,000	22,157	14,215	32,562	27,948

<sup>a</sup> Sources: Shields, 2007; Tobias and Willette, 2008.

<sup>b</sup> Willow Creek escapement includes hatchery fish.

<sup>c</sup> Weir washed out of the Little Susitna River in 2005 and 2006; counts were incomplete.

Salmon stocks in streams the proposed Port MacKenzie Rail Extension would cross contribute to commercial, recreational, subsistence, and personal-use fisheries. In the study area, Chinook salmon stocks are found in Little Willow Creek, Willow Creek, the Little Susitna River, and Fish Creek-Big Lake drainage. Chum salmon are found infrequently in the study area, with spawning stocks of unknown size in the Little Willow Creek, Willow Creek, the Little Susitna River, Little Meadow Creek and Fish Creek-Big Lake drainage. Chum salmon are harvested incidentally to the catch of other salmon. Coho salmon stocks can be found in most streams in the study area. Pink salmon stocks are found in the study area in Little Willow Creek, Willow Creek, the Little Susitna River, an unnamed tributary of the Little Susitna River, Little Meadow Creek, and Fish Creek-Big Lake drainage. Pink salmon are harvested as part of the overall commercial catch, but are not targeted by Upper Cook Inlet fisheries. Sockeye salmon stocks from the Fish Creek-Big Lake drainage, the Little Susitna River, Little Meadow Creek, Lucile Creek, and Fish Creek-

Susitna River drainage all contribute to commercial and subsistence harvests. Stocks of sockeye salmon can be sizeable when reproduction is successful. In recent decades, stocks of native sockeye salmon have been of concern due to overstocking of hatchery fish, degradation of habitat, and predation by non-native northern pike.

In the marine waters of the study area, there is a commercial dip net fishery that harvests spawning stocks of eulachon (smelt) as they return to Susitna River in spring. In 2007, 11 permit holders harvested 62.5 tons of smelt in Upper Cook Inlet, less than the 100-ton harvest quota (Shields, 2007).

### F.3 Subsistence/Personal-Use Fisheries

Alaskans harvest fish for personal consumptive needs under sport, subsistence, and commercial fishing regulations. Beginning in 1981, the Board of Fisheries established personal-use fisheries. Personal-use fishing provides for consumptive needs of Alaska residents unable to meet their consumptive needs under other fisheries (Shields, 2007). Other fisheries can include subsistence fisheries, commercial fisheries, recreational fisheries, marine fisheries, and salmon fisheries, among many others. There are two subsistence fisheries south of the study area (Tyonek and Yentna River fisheries) and two personal-use fisheries in the study area on the Fish Creek-Big Lake drainage (Shields, 2007). The Fish Creek personal-use dip-net fishery sustained an annual mean harvest of 9,700 sockeye salmon from 1987 to 2001 (Shields, 2007). The ADF&G closed the Fish Creek dip-net fishery by Emergency Order in 2001 due to declining escapements and reduction in stocking levels, but could reopen the fishery when escapements are projected to be above 70,000 sockeye salmon (ADF&G, 2009d). However, sockeye salmon escapements have been below 50,000 since 2004 (Table F-4). There is also a personal-use smelt fishery on the Susitna River. The average Susitna River smelt harvest from 1996 to 2005 was 4,800 fish, and generally ranged from 10,000 to 16,900 fish (Shields, 2007). The in-river return of smelt to the Susitna River drainage ranges in the millions, with personal-use harvest accounting for less than 1 percent of this return (Shields, 2007). The ADF&G reports that this fishery will remain stable unless increased access to Susitna River is provided (Shields, 2007).

**Table F-4**  
**Production of Sockeye Salmon in Big Lake<sup>a</sup>**

Year	Total Run	Weir	Spawners	Hatchery Releases			Smolt Emigration	
				Fry	Pre-Smolt	Smolt	Age -1	Age -2
1997	131,814	54,656	48,513	0	0	0	0	0
1998	45,622	22,859	18,789	5,000,000	0	0	0	0
1999	45,714	26,749	25,199	197,000	0	0	0	0
2000	37,635	19,533	16,704	846,000	0	0	0	0
2001	70,013	43,486	39,093	0	0	0	0	0
2002	133,640	90,483	86,181	4,316,000	0	0	0	0
2003	149,586	91,743	86,858	3,589,000	0	0	114,654	2,340
2004	42,160	22,157	20,065	5,000,000	0	0	251,195	25,632
2005	21,967	14,215	12,140	1,742,300	0	0	135,739	22,623
2006	36,567	32,562	26,712	444,200	426,000	0	205,135	19,307
2007	49,548	27,948	24,034	3,812,400	702,500	315,700	278,351	30,928

<sup>a</sup> Source: Shields, 2007.



## F.4 Aquatic Animals of Conservation Concern

Six aquatic animals (five fish and one amphibian) of conservation concern, as identified in the Alaska Comprehensive Wildlife Conservation Strategy, potentially occur within the study area (Table F-5) (ADF&G, 2006). Two of these, the threespine and ninespine stickleback, were collected at stream crossings during SEA field studies (Noel *et al.*, 2008).

**Table F-5**  
**Aquatic Animals of Conservation Concern Potentially Present in the Port MacKenzie Rail Extension Study Area<sup>a</sup>**

Common Name	Species	Conservation Rank	
		Global <sup>b</sup>	State <sup>c</sup>
Fish			
Bering Cisco	<i>Coregonus laurettae</i>	G4	S4
Threespine Stickleback Cook Inlet	<i>Gasterosteus aculeatus</i>	G5T1Q	S1
Ninespine Stickleback	<i>Pungitius pungitius</i>	G5	S4S5
Pacific Lamprey	<i>Lampetra tridentata</i>	G5	S4S5
Rainbow Smelt	<i>Osmerus mordax</i>	G5	S5
Amphibians			
Wood Frog	<i>Rana sylvatica</i>	G5	S3S4

<sup>a</sup> Source: ADF&G, 2006.

<sup>b</sup> Global Rankings: G5 = Secure Globally, G4 = Apparently Secure Globally, G5T1Q = Secure Globally, Intraspecific Critically Imperiled.

<sup>c</sup> State Rankings: S5 = Secure in State, S4 Apparently Secure in State, S4S5 = Rank Uncertain - Long-Term Concern Due To Declines To Secure, S3 = Vulnerable to Extirpation, S3S4 = Rank Uncertain - Vulnerable To Extirpation To Long-Term Concern Due To Declines.

The threespine and ninespine stickleback exists as species complexes of many unique and reproductively isolated populations or potential subspecies. They have been the focus of many evolutionary biology, developmental genetics, animal behavior, ecology and environmental toxicology studies and though neither species is in danger of decline, many unique populations are in serious decline (ADF&G, 2006). Both males and females are territorial, with the male constructing a nest of algae and bits of debris within their territory. The female then enters the nest, deposits her eggs, and departs. The male fertilizes the eggs and remains nearby, with eggs hatching in about a week. Unique stickleback populations in Cook Inlet watersheds are declining due to invasive northern pike, human impacts on water quality, and stocking of salmonids in isolated lakes with no inlet or outlet stream (ADF&G, 2006). Sticklebacks are an important part of the food web and provide a significant portion of the diet of larger fishes such as Dolly Varden, Arctic char, grayling, and lake trout.

A third species of conservation concern, the Bering cisco, is an anadromous whitefish that winters in salt or brackish water near river mouths. They return to freshwater in the spring, but likely do not spawn until the fall (Morrow, 1980). Bering ciscos occur in the Susitna River, and likely migrate into the project area (ADF&G, 2006). The Susitna River stock spends 15 to 20 days in the spawning grounds, with peak spawning over gravel and cobble substrate during the second week of October (ADF&G, 1986). Bering ciscos are believed to have highly confined, localized spawning areas, which would be susceptible to localized habitat disturbance (ADF&G,



2006). Anadromous stocks tend to be slow-growing, late maturing, and long-lived, which leaves them particularly vulnerable to changes in the environment.

Pacific lamprey exhibit two life history strategies. One type, anadromous lampreys, spends most of its adult life in salt water, moving to fresh water to spawn. The second completes its life cycle entirely in fresh water. Both types are found in coastal areas and return to fresh water in fall before they spawn in spring. Lamprey dig nests or redds in cool clear headwater streams. Adults die after the eggs are fertilized. The eggs hatch into a larval form called ammocoetes. The larvae burrow into the silt or sand and remain in this life-stage for 3 to 7 years; they then metamorphose into adults and either become parasitic or non-parasitic. Lampreys are an important part of the food web.

Rainbow smelt can be either anadromous or reside in freshwater lakes. They typically migrate a short distance upstream to spawn in freshwater streams or along lake shores. Their eggs attach to the gravels on the stream or lake bottom. After hatching, larvae drift downstream and concentrate on the bottom, except when they rise to the surface to feed at night. They are an abundant forage fish and are preyed upon by salmon and trout. Rainbow smelt are generally scarce in Alaska, although they can be locally and seasonally abundant (Morrow, 1980). Habitat alterations from water diversions, dams, and sedimentation can impact smelt survival by reducing instream flow, restricting fish passage, and degrading water quality (ADF&G, 2006).

The wood frog's preferred habitat is various kinds of forests/woodlands or at the edges of ponds and streams, willow thickets, and grassy/willow areas. The wood frog lays its eggs in small fishless ponds in wooded or open areas. Wood frogs hibernate as early as August beneath snow in shallow depressions of compacted forest litter. Their range extends farther north than any other North American amphibian. Population trends are unknown, but reports indicate that wood frogs are no longer present at historical breeding sites (ADF&G, 2006). Wood frogs are vulnerable to loss of endemic taxa, climate change, habitat loss and degradation, pollution, eutrophication, predation, and disease.

## **F.5 Existing Fish Use and Habitat Conditions by Segment and Segment Combination**

SEA based the site-specific descriptions in Sections F.5.1 through F.5.3 on anadromous fish habitat use data (Johnson and Daigneault, 2008), freshwater fish distribution data (ADF&G, 2009a), and SEA's field surveys of stream crossings (Noel *et al.*, 2008). All segments would cross streams or waterbodies that provide habitat for fish that could be affected by the proposed rail line.

### **F.5.1 Southern Segments and Segment Combinations**

#### **F.5.1.1 Mac West-Connector 1 Segment Combination**

The Mac West Segment would cross three fish-bearing streams and one boggy stream that likely provides connectivity between lakes and ponds and contains habitat suitable for resident fish such as sticklebacks and sculpins (Tables F-6 and F-7, Figure F-5). The Mac West-Connector 1 Segment Combination would cross a small boggy stream used by resident fish at crossing

**Table F-6**  
**Fish-Bearing Streams Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a</sup> (page 1 of 3)**

Segment/ Crossing Location	Crossing Identification	Stream Name	Alaska Department of Fish and Game Anadromous Catalog Number <sup>b</sup>	Waterbody	Fish	Channel Width (feet)	Habitat <sup>a</sup>						
							Conveyance Type <sup>c</sup>	Conveyance Size <sup>c</sup>	SP	R	M	OW	Potential Blockage <sup>b</sup>
Mac West Segment													
MW-11.0	MW-084R	Inlet to Horseshoe Lake	0.8 mile upstream from COr	Stream	Resident	11	Culvert	36 inches	--	Y	Y	--	No
MW-10.1	MW-085	Inlet to Horseshoe Lake	Edge of COr in Horseshoe Lake	Spring	Resident	9	Culvert	48 inches	--	Y	--	--	No
MW-4.6	MW-095	Unnamed	1.3 miles upstream from COp	Stream	Resident	35	Culvert	48 inches	--	Y	Y	--	No
Mac East													
ME-4.5	ME-078	Unnamed	2.3 mile upstream from COp	Stream	Resident	6	Culvert	36 inches	--	Y	P	--	Yes - DS
Connector 1 Segment													
C1-2.6	C1-026	The Little Susitna Tributary	247-41-10100-2080: COp <sub>r</sub>	Stream	Anadromous	27	Culvert	72 inches	--	Y	Y	--	No
Willow													
MP-190.3	W-098	Little Willow Creek Tributary <sup>d</sup>	0.2 mile upstream from COr	Stream	Anadromous	12.3	Bridge	NA	Y	Y	Y	--	No
MP-189.6	W-099	Unnamed	NC	Stream	Resident	1 to 4	Culvert Extension	36 inches	--	Y	Y	Y	Yes - US
MP-189.3	W-100	Unnamed	NC	Stream	Resident	1 to 2	Culvert Extension	36 inches	--	Y	Y	--	Yes - US
MP-189.0	W-101R	Rodgers Creek	247-41-10200-2130-3020: COr	Stream	Anadromous	36.3	Bridge	NA	Y	Y	Y	Y	No
W-24.0	W-106	Willow Creek	247-41-10200-2120: CHs, COsr, Ksr, P <sub>s</sub>	Stream	Anadromous	97.5	Bridge	NA	Y	Y	Y	Y	No
W-23.1	W-107	Willow Creek Tributary	0.3 mile upstream COr	Stream	Resident	2	Drainage Structure	NA	--	Y	Y	Y	Yes - DS
W-20.9	W-110	Susitna River Tributary <sup>e</sup>	Nominated	Stream	Anadromous	7.4	Culvert	36 inches	Y	Y	Y	Y	Yes - US
W-19.6	W-112	Unnamed	NC	Stream	Resident	1 to 2	Drainage Structure	NA	--	Y	Y	--	No
W-16.7	W-113	Rolly Creek Tributary	1.6 miles upstream COp	Stream	Resident	1 to 2	Culvert	72 inches	--	Y	Y	Y	No - BD
W-14.4	W-116	Rolly Creek Tributary	3.2 miles upstream COp	Stream	Resident	1 to 2	Culvert	36 inches	--	Y	Y	Y	No - BD
W-10.0	W-118R	Fish Creek	247-41-10200-2020: COr, Sp	Stream	Anadromous	15	Drainage Structure	NA	Y	Y	Y	Y	No - BD
W-0.6	W-121R	The Little Susitna River	247-41-10100: CHs, COs, Ks, P <sub>s</sub> , So	Stream	Anadromous	105	Bridge	NA	Y	Y	Y	Y	No

**Table F-6**  
**Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a</sup> (page 2 of 3)**

Segment/ Crossing Location	Crossing Identification	Stream Name	Alaska Department of Fish and Game Anadromous Catalog Number <sup>b</sup>	Waterbody	Fish	Channel Width (feet)	Conveyance		Habitat <sup>b</sup>				Potential Blockage <sup>b</sup>	
							Type <sup>c</sup>	Size <sup>c</sup>	SP	R	M	OW		
Houston North Segment														
MP-179.9	HN-056	Unnamed	NC	Stream	Resident	3	Culvert Extension	48 inches	--	Y	Y	--	Yes - US	
MP-179.4	HN-061R	Unnamed	NC	Stream	Resident	3	Culvert Extension	60 inches	Y	Y	Y	--	Yes - US	
MP-179.0	HN-063R	Unnamed	NC	Stream	Resident	1.7	Culvert Extension	36 inches	Y	Y	Y		Yes - US	
MP-178.5	HN-065R	Lake Creek Tributary	247-41-10100-2231- 3026; COR	Stream	Anadromous	6.3	Culvert Extension	48 inches	Y	Y	Y	--	Yes - US	
MP-177.5	None	Lake Creek Tributary	247-41-10100-2231- 3018-4011: COR	Stream	Anadromous	Less than 2	Culvert Extension	48 inches	--	Y	--	--	Yes - US & DS	
HN-4.8	HNM-122R	Lake Creek Tributary	247-41-10100-2231- 3018; COR	Stream	Anadromous	9	Culvert	72 inches	--	Y	--	--	Yes - US	
HN-4.4	HNM-123	Lake Creek	247-41-10100-2231: COR, Sp	Stream	Anadromous	20	Drainage Structure	NA	--	Y	Y	Y	Yes - US & DS	
HN-3.2	HN-067R	The Little Susitna River	247-41-10100: CHs, COs, Kp, Ps, Sp	Stream	Anadromous	97.5	Bridge	NA	Y	Y	Y	Y	No	
Houston South Segment														
MP-175.0	HS-070R	The Little Susitna Tributary	247-41-10100-2255: COR	Stream	Anadromous	14	Culvert Extension	NA	--	Y	Y	Y	Yes - US	
MP-174.3	HS-071R	The Little Susitna River	247-41-10100: CHp, COs, Ks, Ps	Stream	Anadromous	46.5	Bridge	NA	Y	Y	Y	Y	No	
HS-1.0	HS-075R	The Little Susitna Tributary	0.4 mile upstream from lake with COR	Stream	Resident	18	Culvert	36 inches	--	Y	Y	--	Yes - US	
Houston Segment														
H-9.6	H-040R	Inlet to Colt Lake	NC	Stream	Resident	3.6	Culvert	48 inches	--	Y	Y	Y	No	
H-6.3	H-044	The Little Susitna Tributary	247-41-10100-2150: COR	Stream	Anadromous	16	Drainage Structure	NA	--	Y	Y	Y	Yes - US	
H-4.3	H-046	The Little Susitna Tributary	247-41-10100-2100: COR, Kr	Stream	Anadromous	1 to 3	Culvert	72 inches	--	Y	Y	Y	Yes - US & DS	
H-2.8	H-047	Unnamed	NC	Wetland	Resident	1 to 2	Culvert	48 inches	--	--	Y	--	No	
H-1.2	H-049	Unnamed	NC	Wetland	Resident	1 to 3	Culvert	24 inches	--	Y	Y	--	No	
H-0.8	H-050R	The Little Susitna Tributary	247-41-10100-2090: Ps, COST	Stream	Anadromous	14	Drainage Structure	NA	Y	Y	Y	Y	No	

**Table F-6**  
**Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a</sup> (page 3 of 3)**

Segment/ Crossing Location	Crossing ID	Stream Name	Alaska Department of Fish and Game Anadromous Catalog Number <sup>b</sup>	Waterbody	Fish	Channel Width (feet)	Conveyance		Habitat <sup>b</sup>				Potential Blockage <sup>b</sup>
							Type <sup>c</sup>	Size <sup>c</sup>	SP	R	M	OW	
Big Lake Segment													
MP-170.7	BL-001R	Outlet Loon Lake	NC	Stream	Resident	2.5	Culvert Extension	48 inches	--	Y	Y	--	Yes - US & DS
MP-170.1	BL-003	Outlet Cheri Lake	247-50-10330-2050- 3025: COr	Stream	Anadromous	1.5	Culvert Extension	60 inches	--	Y	Y	--	Yes - US & DS
B-17.5	None	Inlet to Long Lake relocated channel	247-50-10330-2050- 3025: COr	Stream	Anadromous	<1	Drainage Structure	20 feet	--	Y	Y	--	Yes - US & DS
B-17.1 to B- 17.6	None	Inlet to Long Lake	247-50-10330-2050- 3025: COr	Stream	Anadromous	<1	Stream Relocation	2,440 feet of relocation	--	Y	Y	--	Yes - US & DS
B-16.6	BL-007R	Inlet to Long Lake	247-50-10330-2050- 3025: COr	Stream	Anadromous	6.5	Drainage Structure	NA	--	Y	Y	--	Yes - US & DS
B-15.9	BL-008	Little Meadow Creek	247-50-10330-2050- 3050: CHp, COrs, Pp, Ss	Stream	Anadromous	28	Drainage Structure	NA	Y	Y	Y	Y	Yes - US & DS
B-15.2	BL-010R	Lucile Creek	247-50-10330-2050- 3030: Sp, COr	Stream	Anadromous	11.5	Drainage Structure	NA	--	Y	Y	Y	Yes - US & DS
B-9.0	BL-019R	Fish Creek	247-50-10330: CHp, COrs, Kp, Ps, Sp	Stream	Anadromous	28	Drainage Structure	NA	Y	Y	Y	Y	Yes - US & DS
B-6.4	BL-022R	Goose Creek	247-50-10360: COrs, Kr	Stream	Anadromous	6	Drainage Structure	NA	--	Y	Y	Y	Yes - DS

<sup>a</sup> Source: Johnson and Daigneault, 2008; Noel *et al.*, 2008.

<sup>b</sup> Anadromous catalog codes: K = Chinook salmon, CH = chum salmon, CO = coho salmon, P = pink salmon, S = Sockeye salmon, p = present, r = rearing, s = spawning. Kr = Chinook rearing observed but not noted in Alaska Department of Fish and Game Anadromous Catalog. Habitat abbreviations: Rearing (R), Migration (M), and Over-wintering (OW) habitats for either or both anadromous and resident fish species; Spawning (SP) habitat evaluated for resident trout, Arctic grayling and Dolly Varden and anadromous salmon (*i.e.*, gravels and upwelling suitable for spawning are present at crossing site). Y = verified, -- = not present, P = probable. Potential Blockage abbreviations: BD = beaver dam, US = artificial - up stream, DS = artificial - down stream. NC = Not cataloged by ADF&G

<sup>c</sup> Culverts are closed cylindrical structures; size is diameter. Culvert extension is an extension of an existing culvert. Drainage structures could include open bottom box culverts, multiple culverts, precast arches, or single or multiple short-span bridges; type and size to be determined during final design and permitting. Bridges are single or multiple 23-foot short-span bridges. (HDR Alaska, Inc., and TNH-Hanson, LLC, 2008; Pochop, 2008). NA = Not Available.

<sup>d</sup> Spawning substrates, adult coho salmon and juvenile salmonids observed (Noel *et al.*, 2008).

<sup>e</sup> Nominated for the Anadromous Stream Catalog based on data from survey (Noel *et al.*, 2008).

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 1 of 11)

Segment/Crossing Location	Fish Presence	Crossing Identification	Record Number	Life Stages						Habitats		
				Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging	Migratory
Mac West												
MW-11.0	Inlet to Horseshoe Lake	MW-084R	84									
	Rainbow trout				X				X		X	X
	Stickleback			X	X	X	X	X	X		X	X
	Resident game fish				X				X		X	X
MW-10.1	Inlet to Horseshoe Lake	MW-085	85									
	Coho salmon (in lake)				X				X		X	
	Rainbow trout				X				X			
	Threespine stickleback			X	X	X	X	X	X		X	
	Resident game fish				X	X	X	X	X		X	
MW-4.6	Unnamed Stream	MW-095	95									
	Stickleback			X	X	X	X	X	X		X	X
	Resident non-game fish				X				X		X	X
Mac East												
ME-4.5	Unnamed Stream	ME-078	78									
	Stickleback			X	X	X	X	X	X		X	X
	Resident non-game fish				X				X		X	X

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 2 of 11)

Segment/Crossing Location	Fish Presence	Crossing Identification	Record Number	Life Stages						Habitats			
				Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging	Migratory	
Connector 1													
C1-2.6	The Little Susitna Tributary	C1-026	26										
	Coho salmon				X	X	X		X		X	X	X
	Rainbow trout				X	X	X		X		X	X	X
	Slimy Sculpin				X	X	X		X		X	X	X
	Threespine stickleback			X	X	X	X	X	X		X	X	X
	Pacific lamprey								X		X	X	X
Willow													
MP-190.3	Little Willow Creek Tributary <sup>c</sup>	W-098	98										
	Coho salmon			X	X	X	X	X	X		X	X	X
	Rainbow trout			X	X	X	X	X	X		X	X	X
	Resident game fish			X	X	X	X	X	X		X	X	X
	Resident non-game fish			X	X	X	X	X	X	X	X	X	X
MP-189.6	Unnamed Stream	W-099	99										
	Resident non-game fish			X	X	X	X	X	X	X	X	X	X
MP-189.3	Unnamed Stream	W-100	100										
	Resident non-game fish				X	X	X	X	X	X	X	X	X
MP-189.0	Rogers Creek	W-101R	101										
	Coho salmon				X	X	X	X	X	X	X	X	X
	Resident game fish			X	X	X	X	X	X	X	X	X	X

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 3 of 11)

Segment/Crossing Location	Life Stages				Habitats							
	Fish Presence	Crossing Identification	Record Number	Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging	Migratory
Willow (continued)												
W-24.0	Willow Creek	W-106	106									
	Chinook salmon			X	X	X	X	X	X	X	X	X
	Coho salmon			X	X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X				X
	Chum salmon			X	X		X	X				X
	Rainbow trout			X	X	X	X	X	X	X	X	X
	Dolly Varden			X	X	X	X	X	X	X	X	X
	Resident game fish			X	X	X	X	X	X	X	X	X
W 23.1	Resident non-game fish			X	X	X	X	X	X	X	X	X
	Willow Creek Tributary	W-107	107									
	Coho salmon (potential)					X			X		X	X
	Stickleback			X	X	X	X	X	X	X	X	X
	Resident game fish					X	X		X		X	X
W 20.9	Susitna River Tributary <sup>d</sup>	W-110	110									
	Coho salmon				X	X			X		X	X
	Slimy Sculpin					X	X		X		X	X
	Resident game fish			X	X	X	X	X	X	X	X	X
W 19.6	Unnamed Stream	W-112	112									
	Stickleback					X	X		X		X	X
	Resident non-game fish					X	X		X		X	X
W-16.7	Rolly Creek tributary	W-113	113									
	Ninespine stickleback			X	X	X	X	X	X	X	X	X
	Resident game fish					X			X		X	X

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 4 of 11)

Segment/Crossing Location	Life Stages				Habitats							
	Fish Presence	Crossing Identification	Record Number	Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging	Migratory
Willow (continued)												
W-14.4	Rolly Creek Tributary	W-116	116		X	X	X	X	X	X	X	X
	Stickleback											
	Resident game fish					X			X		X	X
W-10.0	Fish Creek	W-118R	118									
	Coho salmon			X	X	X	X	X	X	X	X	X
	Sockeye salmon				X		X					X
	Rainbow trout			X	X	X	X	X	X	X	X	X
	Arctic Grayling			X	X	X	X	X	X	X	X	X
	Northern pike					X	X		X		X	X
	Resident game fish			X	X	X	X	X	X	X	X	X
	The Little Susitna River	W-121R	121									
W-0.6	Chinook salmon			X	X	X	X	X	X	X	X	X
	Sockeye salmon				X		X					X
	Coho salmon			X	X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X		X		X
	Chum salmon			X	X		X	X		X		X
	Whitefish					X	X		X	X	X	X
	Rainbow trout			X	X	X	X	X	X	X	X	X
	Arctic Grayling			X	X	X	X	X	X	X	X	X
	Burbot					X	X		X	X	X	X
	Dolly Varden			X	X	X	X	X	X	X	X	X
	Slimy sculpin			X	X	X	X	X	X	X	X	X
	Stickleback			X	X	X	X	X	X	X	X	X
Lampreys									X		X	



**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 5 of 11)

Segment/Crossing Location	Life Stages				Habitats							
	Fish Presence	Crossing Identification	Record Number	Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging	
Houston North												
MP 179.9	Unnamed Stream	HN-056	56									
	Resident non-game fish			X	X	X	X	X	X		X	
MP 179.4	Unnamed Stream	HN-061R	61									
	Resident non-game fish			X	X	X	X	X	X		X	
	Resident game fish			X	X	X	X		X		X	
MP 179.0	Unnamed Stream	HN-063R	63									
	Resident non-game fish			X	X	X	X	X	X		X	
	Resident game fish			X	X	X	X		X		X	
MP 178.5	Lake Creek Tributary	HN-065R	65									
	Coho salmon					X	X		X		X	
	Resident non-game fish			X	X	X	X	X	X	X	X	
	Resident game fish			X	X	X	X	X	X		X	
MP 177.5	Lake Creek Tributary	None										
	Coho salmon					X	X		X		X	
	Resident non-game fish			X	X	X	X	X	X	X	X	
	Resident game fish				X	X	X		X		X	
HNM-4.8	Lake Creek Tributary	HNM-122R	122									
	Coho salmon					X	X		X		X	
	Resident non-game fish			X	X	X	X	X	X	X	X	
	Resident game fish					X	X		X		X	

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 6 of 11)

Segment/Crossing Location	Life Stages				Habitats					
	Fish Presence	Crossing Identification	Record Number	Eggs	Life Stages			Habitats		
					Fry/Larvae	Juveniles	Adults		Spawning	Rearing
Houston North (continued)										
HN-4.4	Lake Creek	HN-123	123							
	Coho salmon				X		X		X	
	Sockeye salmon			X		X				
	Resident non-game fish			X	X	X	X	X	X	X
	Resident game fish				X	X		X	X	X
HN-3.2	The Little Susitna River	HN-067R	67							
	Chinook salmon				X		X		X	X
	Sockeye salmon					X				X
	Coho salmon			X	X	X	X	X	X	X
	Pink salmon			X	X		X	X		X
	Chum salmon			X	X		X	X		X
	Round Whitefish			X	X	X	X	X	X	X
	Rainbow trout			X	X	X	X	X	X	X
	Arctic grayling			X	X	X	X	X	X	X
	Burbot				X	X	X		X	X
	Northern pike					X	X		X	X
	Dolly Varden			X	X	X	X	X	X	X
	Slimy sculpin			X	X	X	X	X	X	X
	Stickleback			X	X	X	X	X	X	X
	Lampreys								X	X

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 7 of 11)

P-25.1.01.1.1													
Segment/Crossing Location	Fish Presence	Crossing Identification	Record Number	Life Stages						Habitats			
				Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging	Migratory	
Houston South	MP- 175.0	The Little Susitna Tributary	HS-070R	70			X	X		X		X	X
		Coho salmon											
		Resident non-game fish			X	X	X	X	X	X	X	X	X
		Resident game fish					X	X		X		X	X
MP-174.3		The Little Susitna River	HS-071R	71									
		Chinook salmon			X		X	X	X	X	X	X	X
		Sockeye salmon						X					X
		Coho salmon			X	X	X	X	X	X	X	X	X
		Pink salmon			X	X		X	X				X
		Chum salmon				X		X	X		X		X
		Round Whitefish			X	X	X	X	X	X	X	X	X
		Rainbow trout			X	X	X	X	X	X	X	X	X
		Arctic grayling			X	X	X	X	X	X	X	X	X
		Burbot					X	X		X	X	X	X
		Northern pike					X	X		X	X	X	X
		Dolly Varden			X	X	X	X	X	X	X	X	X
		Slimy sculpin			X	X	X	X	X	X	X	X	X
Stickleback			X	X	X	X	X	X	X	X	X		
Lampreys									X		X		
HS-1.0		The Little Susitna Tributary	HS-075R	75								X	X
		Resident non-game fish			X	X	X	X	X	X	X	X	X
		Resident game fish					X	X		X		X	X

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 8 of 11)

Segment/Crossing Location	Fish Presence	Crossing Identification	Record Number	Life Stages					Habitats			
				Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging	Migratory
<b>Houston</b>												
H-9.6	Inlet to Colt Lake	H-040R	40	X	X	X	X	X	X	X	X	X
	Stickleback											
	Resident game fish					X	X		X		X	X
H-6.3	The Little Susitna Tributary	H-044	44									
	Coho salmon					X	X		X		X	X
	Resident non-game fish			X	X	X	X	X	X	X	X	X
	Resident game fish					X	X		X	X	X	X
H-4.3	The Little Susitna Tributary	H-046	46									
	Chinook salmon					X			X		X	X
	Coho salmon					X			X		X	X
	Ninespine stickleback			X	X	X	X	X	X	X	X	X
	Resident non-game fish			X	X	X	X	X	X	X	X	X
	Resident game fish					X	X		X	X	X	X
H-2.8	Unnamed Stream	H-047	47									
	Resident non-game fish					X	X					X
H-1.2	Unnamed Stream	H-049	49									
	Resident non-game fish					X	X		X		X	X
H-0.8	The Little Susitna Tributary	H-050R	50									
	Coho salmon			X	X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X		X		X
	Rainbow trout			X	X	X	X	X	X	X	X	X
	Slimy sculpin			X	X	X	X	X	X	X	X	X
	Resident game fish			X	X	X	X	X	X	X	X	X
	Resident non-game fish			X	X	X	X	X	X	X	X	X

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 9 of 11)

Segment/Crossing Location	Fish Presence	Crossing Identification	Record Number	Life Stages						Habitats	
				Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging
<b>Big Lake</b>											
MP-170.7	Outlet Loon Lake	BL-001R	1								
	Rainbow trout					X			X		X
	Resident non-game fish			X	X	X	X	X	X		X
	Resident game fish					X			X		X
MP-170.1	Outlet Cheri Lake	BL-003	3								
	Coho salmon					X	X		X		X
	Rainbow trout					X	X		X		X
	Slimy sculpin					X	X		X		X
	Resident non-game fish			X	X	X	X	X	X		X
	Resident game fish					X	X		X		X
B-18.3	Inlet to Long Lake	None									
	Coho salmon					X	X		X		X
	Rainbow trout					X	X		X		X
	Slimy sculpin					X	X		X		X
	Resident non-game fish			X	X	X	X	X	X		X
	Resident game fish					X	X		X		X
B-17.1 to B-17.6	Inlet to Long Lake	None									
	Coho salmon					X	X		X		X
	Rainbow trout					X	X		X		X
	Slimy sculpin					X	X		X		X
	Resident non-game fish			X	X	X	X	X	X		X
	Resident game fish					X	X		X		X

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 10 of 11)

(Page 10 of 17)

Segment/Crossing Location	Fish Presence	Crossing Identification	Record Number	Life Stages						Habitats		
				Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging	Migratory
Big Lake (continued)												
B-16.6	Inlet to Long Lake	BL-007R	7									
	Coho salmon				X	X	X		X		X	X
	Rainbow trout				X	X	X		X		X	X
	Slimy sculpin				X	X	X		X		X	X
	Resident non-game fish			X	X	X	X	X	X		X	X
	Resident game fish				X	X	X		X		X	X
B-15.9	Little Meadow Creek	BL-008	8									
	Coho salmon			X	X	X	X	X	X	X	X	X
	Pink salmon						X					X
	Chum salmon						X					X
	Sockeye salmon			X	X		X	X		X		X
	Rainbow trout			X	X	X	X	X	X	X	X	X
	Slimy sculpin			X	X	X	X	X	X	X	X	X
	Threespine stickleback			X	X	X	X	X	X	X	X	X
	Resident non-game fish			X	X	X	X	X	X	X	X	X
	Resident game fish			X	X	X	X	X	X	X	X	X
B-15.2	Lucille Creek	BL-010R	10									
	Coho salmon				X	X			X		X	X
	Sockeye salmon					X						X
	Slimy sculpin				X	X			X		X	X
	Threespine stickleback			X	X	X	X	X	X	X	X	X
	Resident non-game fish			X	X	X	X	X	X	X	X	X
	Resident game fish					X	X		X	X	X	X

**Table F-7**  
**Fish, Life Stages, and Habitats at Fish-Bearing Streams the Proposed Port MacKenzie Rail Extension Segments would Cross<sup>a,b</sup>**  
 (page 11 of 11)

Segment/Crossing Location	Life Stages				Habitats							
	Fish Presence	Crossing Identification	Record Number	Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging	Migratory
Big Lake (continued)												
B- 9.0	Fish Creek	BL-019R	19									
	Chinook salmon			X	X	X	X	X	X	X	X	X
	Sockeye salmon			X	X		X	X		X		X
	Coho salmon			X	X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X		X		X
	Chum salmon			X	X		X	X		X		X
	Rainbow trout			X	X	X	X	X	X	X	X	X
	Dolly Varden			X	X	X	X	X	X	X	X	X
	Northern pike					X	X		X		X	X
	Longnose sucker			X	X	X	X	X	X	X	X	X
	Round Whitefish			X	X	X	X	X	X	X	X	X
	Slimy sculpin			X	X	X	X	X	X	X	X	X
	Threespine stickleback			X	X	X	X	X	X	X	X	X
	Ninespine stickleback			X	X	X	X	X	X	X	X	X
	Lampreys					X	X		X	X	X	X
B-6.4	Goose Creek	BL-022R	22									
	Chinook salmon					X			X	X	X	X
	Coho salmon			X	X	X	X		X	X	X	X
	Rainbow trout					X	X		X	X	X	X
	Threespine stickleback			X	X	X	X	X	X	X	X	X
	Resident non-game fish			X	X	X	X	X	X	X	X	X
	Resident game fish					X	X		X	X	X	X
<sup>a</sup> Sources: ADF&G, 2007a; ADF&G, 2009a; Johnson and Daigneault, 2008; Noel <i>et al.</i> , 2008.												
<sup>b</sup> Evaluation based on habitat at crossing location, waterbody connectivity, reported fish occurrence, and surveyed fish occurrence.												
<sup>c</sup> Nominated for the Anadromous Stream Catalog based on data from survey (Noel <i>et al.</i> , 2008)												
<sup>d</sup> Suitable spawning habitat for anadromous and resident game fish present (Noel <i>et al.</i> , 2008)												

<sup>a</sup> Sources: ADF&G, 2007a; ADF&G, 2009a; Johnson and Daigneault, 2008; Noel *et al.*, 2008.

<sup>b</sup> Evaluation based on habitat at crossing location, waterbody connectivity, reported fish occurrence, and surveyed fish occurrence.

<sup>c</sup> Nominated for the Anadromous Stream Catalog based on data from survey (Noel *et al.*, 2008)

<sup>d</sup> Suitable spawning habitat for anadromous and resident game fish present (Noel *et al.*, 2008)

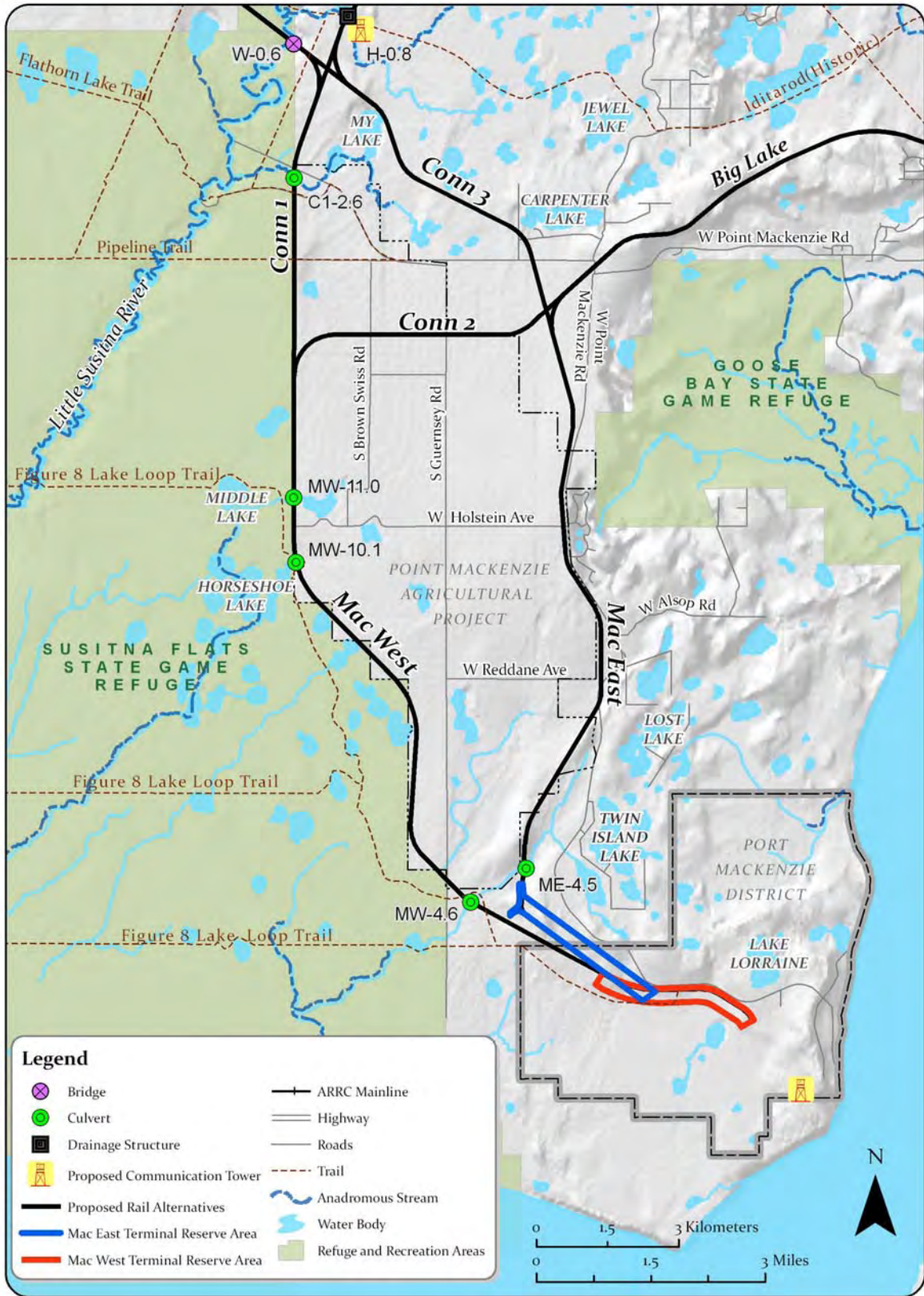


Figure F-5. Fish-Bearing Stream Crossings along the Mac East, Mac West, and Connector Segments (Johnson and Daigneault, 2008; ADF&G, 2009a; Noel et al., 2008)



MW-11.0 (Record 84, Noel *et al.*, 2008) and a drainage from a spring that flows approximately 70 feet into nearby Horseshoe Lake at crossing MW-10.1 (Record 85, Noel *et al.*, 2008). The spring at crossing MW-10.1 likely provides rearing habitat for juvenile salmonids via the springs' connection to Horseshoe Lake, a cataloged coho salmon habitat (Johnson and Daigneault, 2008). Drainage and filling of agricultural lands east of the Mac West Segment has likely altered runoff and groundwater input to these streams. The culverts proposed for these two crossings would result in loss of primarily rearing habitats (Tables F-6 and F-7). The boggy stream at crossing MW-4.6 is about 1.3 miles upstream from a stream that coho salmon use (Table F-6; 247-41-10080-2036; Johnson and Daigneault, 2008).

Connector 1 Segment would cross a cataloged anadromous tributary of the Little Susitna River at C1-2.6 (Table F-6). This tributary provides rearing habitat for coho salmon and resident fish, and likely provides migratory access to upstream spawning and rearing habitat (Table F-7). At present, the channel is stable, with an average width of about 27 feet (Table F-6; Record 26, Noel *et al.*, 2008). The culvert proposed at this crossing for the access road and railbed would eliminate the existing emergent vegetation along the stream margin and submergent vegetation in the stream channel, fragmenting coho salmon and resident fish rearing habitat (Photo 1, Record 26, Noel *et al.*, 2008). Substrates at the crossing site are organic debris and fines, which would not provide spawning habitat for salmonids or resident game fish such as rainbow trout, Dolly Varden, or arctic grayling (Record 26, Noel *et al.*, 2008).

#### **F.5.1.2 Mac West-Connector 2 Segment Combination**

The Mac West-Connector 2 Segment Combination would cross the two resident fish streams at crossings MW-11.0 and MW-10.1 and a boggy stream at crossing MW-4.6, as described above. Connector 2 Segment would not cross any fish-bearing streams (Tables F-6 and F-7, Figure F-5).

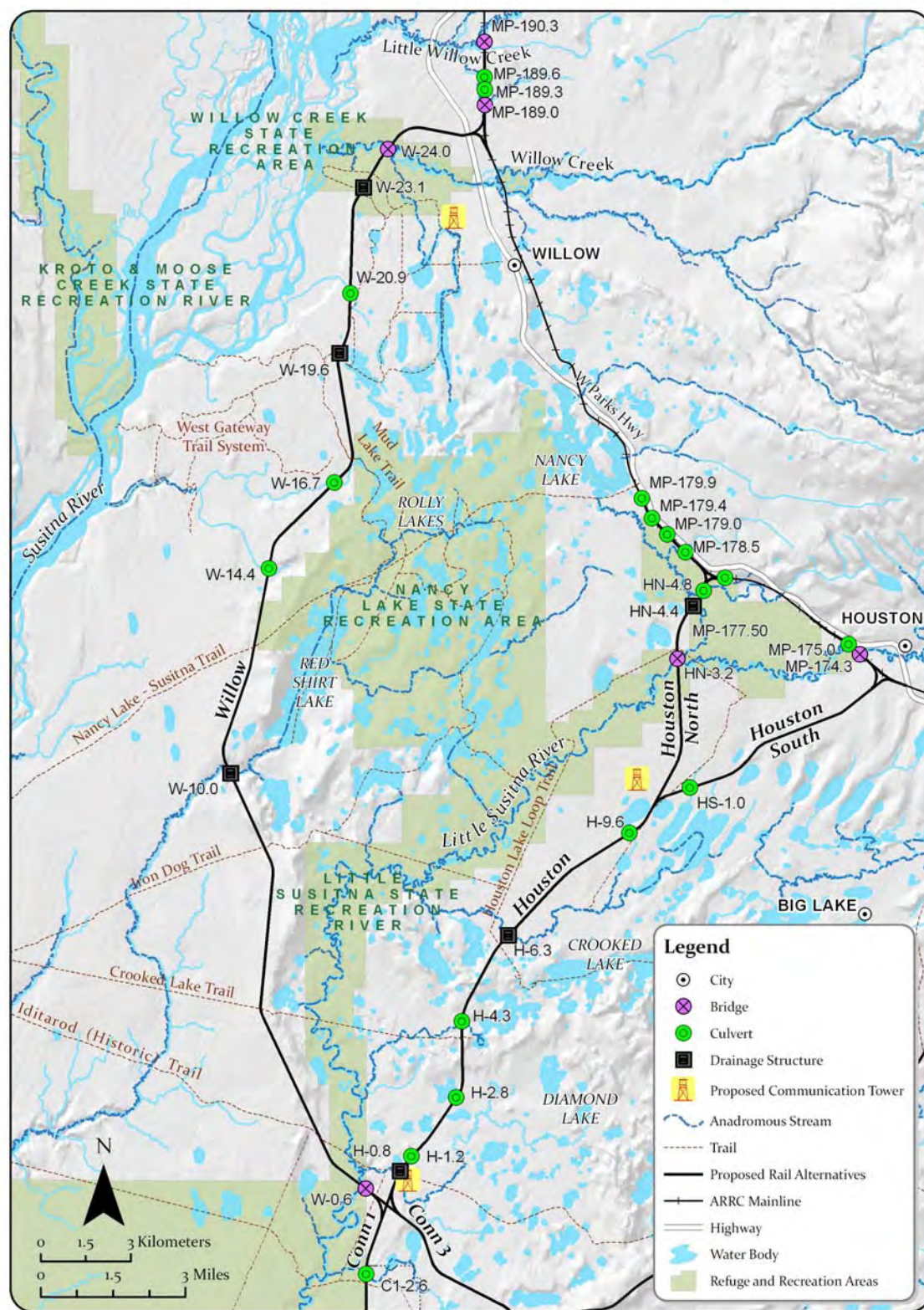
#### **F.5.1.3 Mac East-Connector 3 Segment Combination**

The Mac East-Connector 3 Segment Combination would cross the same boggy stream at ME-4.5 that the Mac West Segment would cross at MW-4.6 (Tables F-6 and F-7, Figure F-5). This crossing is about 2.3 miles upstream from a stream that coho salmon use (Table F-6; 247-41-10080-2036; Johnson and Daigneault, 2008). Although no fish were documented at this location during SEA field studies in 2008 (Noel *et al.*, 2008), habitats suitable for resident fish were present and this stream and connected wetlands might provide access between lakes and ponds that are likely used during periods of high water. Connector 3 Segment would not cross any streams with fish habitat.

### **F.5.2 Northern Segments and Segment Combinations**

#### **F.5.2.1 Willow**

The Willow Segment would cross waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including Rodgers Creek, Willow Creek, the Fish Creek-Susitna River tributary, and the Little Susitna River. The Willow Segment would cross 12 streams with fish or fish habitat (Tables F-6 and F-7, Figure F-6) including four crossings



**Figure F-6. Fish-Bearing Stream Crossings along the Willow, Houston, Houston North, and Houston South Segments (Johnson and Daigneault, 2008; ADF&G, 2009a; Noel et al., 2008)**

documented as used by anadromous fish, one crossing that has been nominated as used (W-20.9), and one crossing (MP-190.3) where spawning habitat and salmon were observed within the floodplain of Little Willow Creek (Johnson and Daigneault, 2008; Noel *et al.*, 2008).

The Willow Segment would cross tributaries of the Susitna River including Rodgers Creek, Willow Creek, Rolly Creek, and Fish Creek and several unnamed streams (Table F-6, Figure F-6). Four of these crossings (MP-190.3, MP-189.6, MP-189.3, and MP-189.0), an unnamed tributary of Little Willow Creek, two boggy streams, and Rogers Creek parallel existing crossings of the Alaska Railroad Corporation (ARRC) main line. The existing structures at these crossings include a bridge at crossing MP-190.3 (Photo 2, Record 98, Noel *et al.*, 2008), culverts at crossings MP-189.6 (Photo 3, Record 99, Noel *et al.*, 2008) and MP-189.3 (Photo 4, Record 100, Noel *et al.*, 2008), and another bridge at crossing MP-189.0 (Photo 5, Record 101, Noel *et al.*, 2008). Construction of similar bridges and extensions of existing culverts as proposed by ARRC would result in additional habitat loss and degradation at these locations. Some of the existing culverts have resulted in ponding and potential blockage of fish movements (Photos 3 and 4). In addition, the end of the siding would encroach on the Little Willow Creek crossing of the main line and would result in placement of some fill into an oxbow of this creek.

The crossing of Willow Creek (W-24.0; Photo 6, Record 106, Noel *et al.*, 2008) would be within the Willow Creek State Recreation Area (Figure F-6). Willow Creek is the second most popular sport fishery in the study area, with an estimated 22,000 angler days and almost 7,000 fish harvested in 2007 (ADF&G, 2009c). Construction of a crossing at this location would result in loss of spawning and rearing habitat and the bridge would potentially intercept large woody debris input from the surrounding spruce forest. SEA observed pink salmon spread out along the left bank on a spawning bed at the crossing location during field investigations (Record 106, Noel *et al.*, 2008). The proposed bridge would be the first structure on Willow Creek above its confluence with the Susitna River. The section of Willow Creek at the proposed crossing supports coho salmon rearing and migration and Willow Creek supports Chinook, chum, coho, and pink salmon (Table F-6; Johnson and Daigneault, 2008).

Upstream about 0.4 mile from the Fish Creek crossing (W-10.0; Photo 7, Record 118, Noel *et al.*, 2008) habitats were observed to be suitable for anadromous and resident fish spawning, rearing, and overwintering; however, no fish were observed or collected (Table F-6). There were several active beaver dams downstream from the site, including a new dam that had caused recent overbank flooding. This section of Fish Creek supports sockeye salmon (Johnson and Daigneault, 2008).

The Willow Segment would cross the Little Susitna River, which is a stable productive system that supports all five Pacific salmon, and contributed to an estimated harvest of more than 17,000 fish, primarily salmon (96 percent), over an estimated 35,000 fisherman days during 2007 (ADF&G, 2009c). Approximately 0.5 mile upstream of the proposed crossing site (W-0.6), there are habitats suitable for salmon and resident game fish spawning, rearing, migration, and overwintering (Table F-6; Photo 8, Record 121, Noel *et al.*, 2008). This section of the Little Susitna River supports spawning habitat for coho and pink salmon and rearing habitat for coho salmon and migration habitat for Chinook, chum, and sockeye salmon (Johnson and Daigneault, 2008).

### F.5.2.2 Houston-Houston North Segment Combination

The Houston-Houston North Segment Combination would cross waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including Lake Creek and the Little Susitna River, and many unnamed tributaries to these waters (Figure F-6). The Houston-Houston North Segment Combination would cross 14 fish-bearing streams (Tables F-6 and F-7, Figure F-6). Eight crossings are streams documented to provide anadromous fish habitat (Johnson and Daigneault, 2008). Four crossings provide resident fish habitat, and an additional two wetland crossings likely provide seasonal connections between lakes (Tables F-6 and F-7).

The placement of the rail siding along the main line at the segment combination tie-in area would cross the same fish-bearing streams as the main line, requiring culvert extensions for the siding. All of the crossings of streams along the existing main line (MP-179.9 to MP-177.5) might have upstream blockages as a result of the main line, Parks Highway, or secondary road crossings (Table F-6, Figure F-6). The main line crossing upstream of MP-178.5 would be an extension of the existing culvert, which is slightly perched above the stream bottom (Photo 9, Record 65, Noel *et al.*, 2008). Upstream from the crossing at MP-177.5, a secondary road might be blocking this stream. Both streams (at MP-178.5 and MP-177.5) are tributaries of Lake Creek and have been documented as providing rearing habitat for coho salmon (Table F-6, Figure F-6). The channel of Lake Creek is about 20 feet wide at the proposed crossing (HN-4.4) and provides rearing habitat for coho salmon and resident fish, and sockeye salmon use the channel to access Nancy Lake (Table F-6, Figure F-6). This reach of Lake Creek is within the Little Susitna State Recreation River and is considered high value for fish habitat and recreational use (Photo 10, Record 123, Noel *et al.*, 2008).

The Little Susitna River is a highly productive system that supports all five species of Pacific salmon, Dolly Varden, burbot, and arctic grayling (ADF&G, 1988). The bridge proposed for the Little Susitna River crossing would likely require instream supports to span the channel, which has a wetted width of about 100 feet at this location (HN-3.2; Photo 11, Record 67, Noel *et al.*, 2008).

The Houston Segment of the Houston-Houston North Segment Combination would cross three tributaries of the Little Susitna River that support anadromous fish (H-6.3, H-4.3, and H-0.8; Tables F-6 and F-7, Figure F-6). Two of these tributaries, at crossings H-6.3 and H-4.3, provide access for coho salmon to Horseshoe Lake and Finger Lake, respectively (Figure F-6); and the other tributary, at crossing H-0.8, provides spawning habitat for pink and coho salmon (Photo 12, Record 50, Noel *et al.*, 2008). One stream crossing (H-9.6) provides resident fish habitat and connectivity between Muleshoe Lake and Colt Lake, which supports coho salmon (Record 40, Noel *et al.*, 2008). Two wetland crossings (H-2.8 and H-1.2), while not identified as important for providing fish habitat during SEA field evaluations, likely provide seasonal interlake connectivity for resident fish and provide nutrient input for the production of invertebrate prey for downstream resident and anadromous fish (Table F-6; Records 47 and 49, Noel *et al.*, 2008).

### **F.5.2.3 Houston-Houston South Segment Combination**

The Houston-Houston South Segment Combination would cross nine fish-bearing streams, including five anadromous fish streams (Johnson and Daigneault, 2008) and two streams that provide seasonal interlake connectivity for resident fish (Table F-6, Figure F-6).

The existing main line crosses and the proposed rail line extension would cross a small tributary of the Little Susitna River (MP-175.0; Record 70, Noel *et al.*, 2008) that connects to an abandoned meander. This stream, which is cataloged as coho rearing habitat (Table F-6), appears to have been blocked upstream by construction of Parks Highway and a submerged culvert in the existing railbed (Photo 13, Record 70, Noel *et al.*, 2008).

The placement of the rail siding along the main line at the segment combination tie-in area would cross the same fish-bearing streams as the main line, requiring a culvert extension and a new bridge for the siding. The Little Susitna River crossing (MP-174.3) would be above the river's confluence with Lake Creek and would be above the occurrence of sockeye salmon, although pink salmon spawning has been documented above this reach (Table F-6, Figure F-6; Johnson Daigneault, 2008). The crossing area provides some spawning habitat, but most of the Chinook salmon in the Little Susitna River system spawn in habitats upstream of Parks Highway (Ivey, 2009). Where the rail line extension would cross the Little Susitna River (MP-174.3; Record 71, Noel *et al.*, 2008), meanders and oxbows parallel the existing rail line. The proposed bridge would be just downstream of the existing rail bridge (Photo 14, Record 71, Noel *et al.*, 2008), and some of these backwaters would be filled. The increased loss of riparian vegetation due to bridge construction and the filling of backwater habitats, and the increased need for bank hardening with riprap as the meandering channel continues to erode the existing bridge and edges toward the existing railbed, would decrease habitat suitability for spawning and rearing salmon.

The remaining Houston-Houston South Segment Combination crossings (H-9.6 to H-0.8) are as described for Houston-Houston North Segment Combination in Section F.5.2.2.

### **F.5.2.4 Big Lake Segment**

The Big Lake Segment would cross waters important for sustaining recreational and commercial salmon fisheries in the Big Lake and Goose Creek drainages in Southcentral Alaska, including Little Meadow Creek, Lucile Creek, Fish Creek, and Goose Creek. The Big Lake Segment would cross fish-bearing streams in nine locations, including one stream the segment would cross or alter in four different locations (Tables F-6). Five streams the Big Lake Segment would cross provide anadromous fish habitat for coho salmon; sockeye salmon also use three of these streams (Tables F-6 and F-7, Johnson and Daigneault, 2008). Late-run sockeye salmon are an important stock that has experienced wide fluctuations in abundance, but in most years provides a surplus for users, indicating the population is healthy (Shields, 2007; Tobias and Willett, 2008). One crossing provides resident fish habitat (Table F-6).

The placement of the rail siding along the main line at the segment tie-in area would cross the same fish-bearing streams as the main line, requiring culvert extensions for the siding. Two culverted stream crossings under the main line provide conveyance for Loon Lake (MP-170.7)

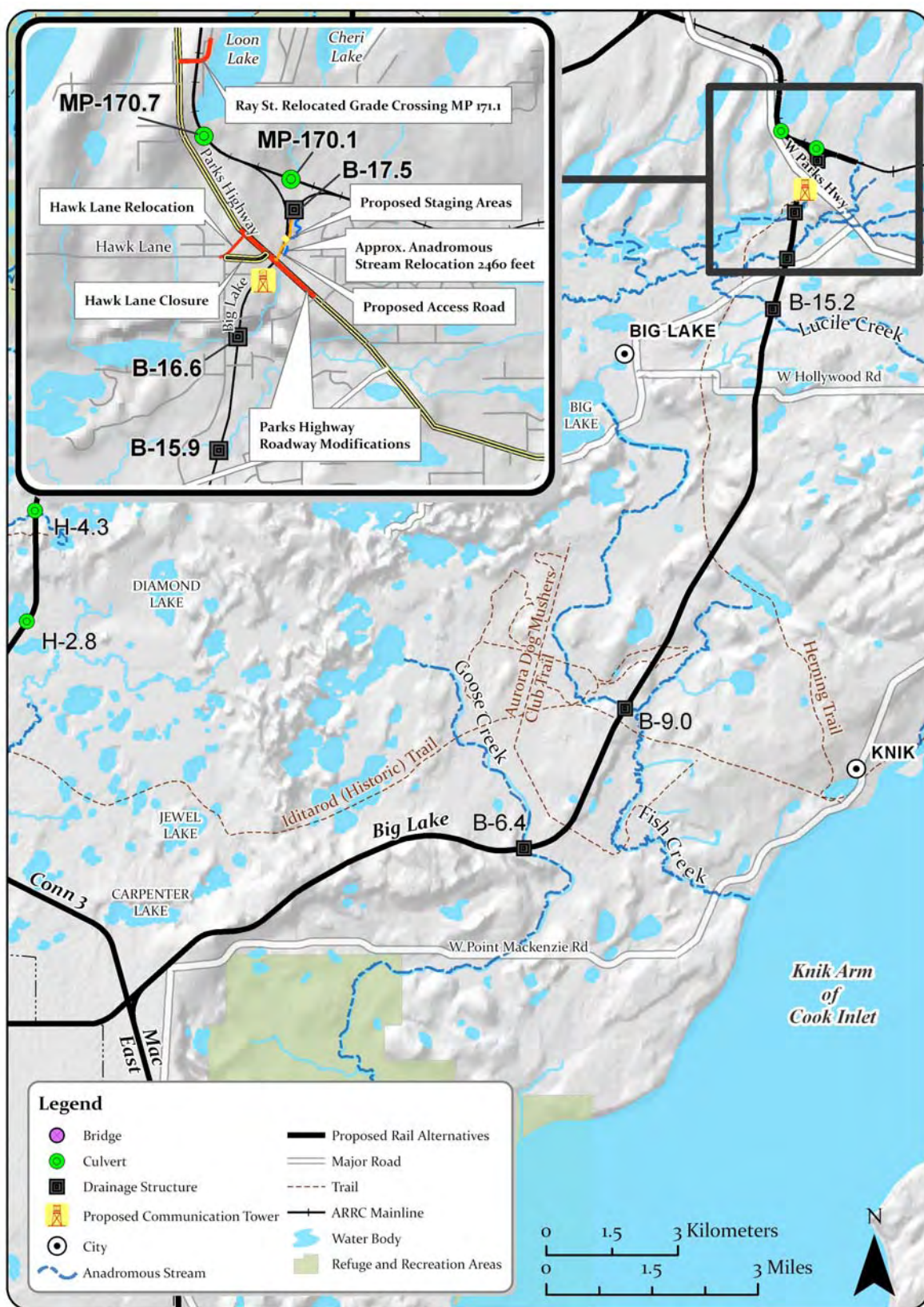


and Cheri Lake (MP-170.1) outflows. ARRC would extend these existing culverts for the construction of the rail siding to ensure continued conveyance of these streams. The existing culvert crossing for the Loon Lake outflow (MP-170.7) appears to allow passage of water; however, repairs to this structure indicate that the culvert is in danger of collapse (Photo 15, Record 1, Noel *et al.*, 2008). The existing culvert crossing for the Cheri Lake outflow is perched above the stream bed (MP-170.1; Photo 16, Record 3, Noel *et al.*, 2008).

The Cheri Lake outflow stream connects Cheri Lake and Long Lake, and is documented as coho salmon rearing habitat; the Big Lake Segment would cross the Cheri Lake outflow three times (MP-170.1, B-18.3, and B-16.6; Table F-6), with one of the crossings (B-18.3) a result of relocating the stream. ARRC would relocate two sections and a total of 2,440 feet of this stream channel into a new 2,460-foot-long channel between approximately Mile Post B-17.1 and Mile Post B-17.6. The stream channel is not well defined in this area and the construction of the Big Lake Segment would require filling and relocation of this stream. Parks Highway and two secondary roads upstream from the proposed rail crossing at B-16.6 also cross this stream. The existing culvert at the road crossing downstream from B-16.6 had been replaced at least once because there is a perched dry culvert and two culverts receiving flow from this stream (Photo 17, Record 7, Noel *et al.*, 2008). Water velocity is very slow at this location due to the improperly bedded road culverts, and it does not appear to gain sufficient velocity to provide for passage of adult salmon. With construction of the two new crossings and one culvert extension for this stream from the Big Lake Segment and five existing culverts under roads, there would be a total of eight crossings on the stream connecting Cheri and Long Lakes, in addition to a relocation of the channel. The multiple culvert crossings appear to have reduced the capacity of this stream to provide habitat for anadromous and resident fish, although coho salmon were captured just above the road culvert, 400 feet downstream from the proposed rail crossing at B-16.6 (Record 7, Noel *et al.*, 2008).

The Little Meadow Creek crossing (B-15.9; Photo 18, Record 8 Noel *et al.*, 2008) would be within a 28-foot-wide reach of the stream that provides spawning, rearing, migratory, and overwinter habitats for chum, coho, pink and sockeye salmon, and habitats for resident fish (Tables F-6 and F-7). Spawning sockeye salmon were observed during a SEA field visit, along with redds created by earlier spawning salmon (Record 8, Noel *et al.*, 2008). The proposed drainage structure could adversely impact fish if it is not designed to allow passage for juvenile and adult fish to and from upstream and downstream lakes and tributaries, and movement of stream-bed gravels. The Lucile Creek crossing (B-15.2) contains juvenile rearing and likely overwintering habitat, and a migration passage for both coho and sockeye salmon (Photo 19, Record 10, Noel *et al.*, 2008).

The Fish Creek drainage supports Chinook, coho, chum, pink and sockeye salmon and contributes to sockeye salmon production in the Upper Cook Inlet (Tables F-6 and F-7, Figure F-7). The crossing location (B-9.0) supports coho rearing and sockeye migration and resident fish spawning, rearing, migration, and overwintering (Tables F-6 and F-7; Photo 20, Record 19, Noel *et al.*, 2008). Fish Creek supports a large and complex population of resident and anadromous fish. It is a migratory corridor to Big Lake that supports one of the most important sockeye salmon runs in the study area. The habitat at the crossing location is complex and undisturbed, with spawning gravels and deep pools for overwintering (Record 19, Noel *et al.*, 2008).



**Figure F-7. Fish-Bearing Stream Crossings along the Big Lake Segment**  
(Johnson and Daigneault, 2008; ADF&G, 2009a; Noel *et al.*, 2008)

The Goose Creek drainage supports coho salmon spawning and rearing and many resident fish. The crossing location (B-6.4) is within a large fen complex with the stream surrounded by floating wetland vegetation (Photo 21, Record 22, Noel *et al.*, 2008; see the wetlands discussion in Chapter 4). This system is likely primarily groundwater fed, with a relatively stable water level that remains unfrozen during winter and provides overwintering habitat for anadromous and resident fish. The proposed crossing would result in the loss of about 19 acres of high-value wetland habitat due to excavation, filling, and draining of the system required for construction of the railbed approach to the drainage structure, which would likely result in reduced productivity as fish rearing habitat for this system. A crossing at this location would likely destroy unique habitat features because the fen would either have to be drained to provide an area for construction, or the water transport under the floating mat vegetation would have to be channeled and filled. This wetland is likely one of the largest juvenile rearing areas, other than lakes with large shelves, in the project area.

## F.6 Impacts to Aquatic Animals of Conservation Concern

Three aquatic animals of conservation concern (threespine stickleback, ninespine stickleback, and Pacific lamprey) have either been reported to occur at or near a stream crossing or have been reported to occur within the stream upstream or downstream of the crossing (ADF&G, 2009a; Noel *et al.*, 2008). Of the total of 42 proposed fish-bearing stream crossings, 18 contained sticklebacks, Pacific lamprey, or both (Table F-8). Occurrence of sticklebacks and Pacific lamprey for fish-bearing stream crossings summarized by alternative indicates that the Mac West-Connector 1-Willow Alternative would have the most (10) occurrences and the Mac East-Connector 3-Houston-Houston North and Mac East-Connector 3-Houston-Houston South alternatives would have the fewest (5) occurrences (Table F-9).

**Table F-8**  
**Summary of Crossings of Fish-Bearing Streams Containing Aquatic Animals of Conservation Concern<sup>a</sup> (page 1 of 2)**

Segment/Location	Threespine Stickleback	Ninespine Stickleback	Stickleback	Pacific Lamprey
<b>Mac West</b>				
MW-11.0			Y	
MW-10.1	Y			
MW-4.6			Y	
<b>Mac East</b>				
ME-4.5			Y	
<b>Connector 1</b>				
C1-2.6	Y			Y
<b>Willow</b>				
W-23.1			Y	
W-19.6			Y	
W-16.7		Y		
W-14.4			Y	
W-0.6				Y
<b>Houston North</b>				
HN-3.2			Y	Y
<b>Houston South</b>				
MP-174.3			Y	Y
<b>Houston</b>				
H-4.3		Y		
H-9.6			Y	



**Table F-8**  
**Summary of Crossings of Fish-Bearing Streams Containing Aquatic Animals of Conservation Concern<sup>a</sup> (page 2 of 2)**

Segment/Location	Threespine Stickleback	Ninespine Stickleback	Stickleback	Pacific Lamprey
<b>Big Lake</b>				
B-15.2	Y			
B-15.9	Y			
B-6.4	Y			
B-9.0	Y	Y		Y
<b>Total Crossings</b>	<b>6</b>	<b>3</b>	<b>9</b>	<b>5</b>

<sup>a</sup> Sources: ADF&G, 2007a; ADF&G, 2009a; Noel *et al.*, 2008.

Note: No fish-bearing streams along Connector 2 and Connector 3 segments.

**Table F-9**  
**Crossings of Fish-Bearing Streams Containing Aquatic Animals of Conservation by Proposed Port MacKenzie Rail Extension Alternatives**

Alternatives	Threespine Stickleback	Ninespine Stickleback	Stickleback	Pacific Lamprey
Mac West-Connector 1-Willow	2	1	5	2
Mac West-Connector 1-Houston-Houston North	2	1	4	2
Mac West-Connector 1-Houston-Houston South	2	1	4	2
Mac West-Connector 2-Big Lake	5	1	2	1
Mac East-Connector 3-Willow	0	1	4	1
Mac East-Connector 3-Houston-Houston North	0	1	3	1
Mac East-Connector 3-Houston-Houston South	0	1	3	1
Mac East-Big Lake	4	1	1	1

<sup>a</sup> Sources: ADF&G, 2007a; ADF&G, 2009a; Noel *et al.*, 2008.

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## **APPENDIX G**

### **ESSENTIAL FISH HABITAT**

## **G. ESSENTIAL FISH HABITAT ASSESSMENT**

This assessment of Essential Fish Habitat (EFH) is for the Alaska Railroad Corporation's (ARRC or the Applicant) proposed Port MacKenzie Rail Extension (the Project). The assessment considers the Applicant's proposed action and a range of reasonable alternatives that have been included in the Surface Transportation Board's (STB or the Board) Section of Environmental Analysis' (SEA) Environmental Impact Statement (EIS).

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Section 305(b)(2) of the Magnuson-Stevens Act requires Federal agencies to consult with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service on all actions, or proposed actions, authorized, funded, or undertaken by the agency that could adversely affect EFH.

The EFH guidelines (50 Code of Federal Regulations [CFR] 600.06-600.930) outline the process for Federal agencies, the National Marine Fisheries Service, and the Fishery Management Councils to satisfy the EFH consultation requirements under Section 305((b)(2)-(4)) of the Magnuson-Stevens Act. As part of the EFH consultation process, the guidelines require Federal agencies to prepare a written EFH assessment describing the effects of their actions on EFH.

This appendix provides an EFH assessment for STB actions related to the Project. SEA has initiated consultation with National Marine Fisheries Service and has developed mitigation measures for EFH designated waters crossed by the Project and used by anadromous salmon under National Marine Fisheries Service jurisdiction.

### **G.1 Description of the Proposed Project**

The Applicant proposes to construct and operate 30 to 45 miles of single-track rail line between Port MacKenzie (the Port) and the existing ARRC main line between Wasilla and north of Willow, Alaska (Figure G-1). The rail line would be designed for transportation of commercial freight and would include construction of other facilities needed to support rail line operations. Anticipated train traffic would be two freight trains, daily on average, in each direction. A terminal reserve area along the southern terminus of the rail line would consist of yard sidings, storage areas, and a terminal building to support train maintenance.

The EIS considers eight build alternatives that consist of southern and northern segments, with possible connector segments between (Figure G-1). The southern segments, Mac West and Mac East, would run either east or west of the Point MacKenzie Agricultural Project. The northern segments – Willow, Houston-Houston North, Houston-Houston South, and Big Lake, would run from north of the Point MacKenzie Agricultural Project to points on the main line near Willow, Houston, and east of Big Lake, respectively. Connector segments link the north and south segments to create eight possible routes for the proposed rail line. The Applicant proposes a 200-foot-wide right-of-way for the rail line. Construction activities are anticipated to occur within the 200-foot-wide right-of-way, unless otherwise noted.

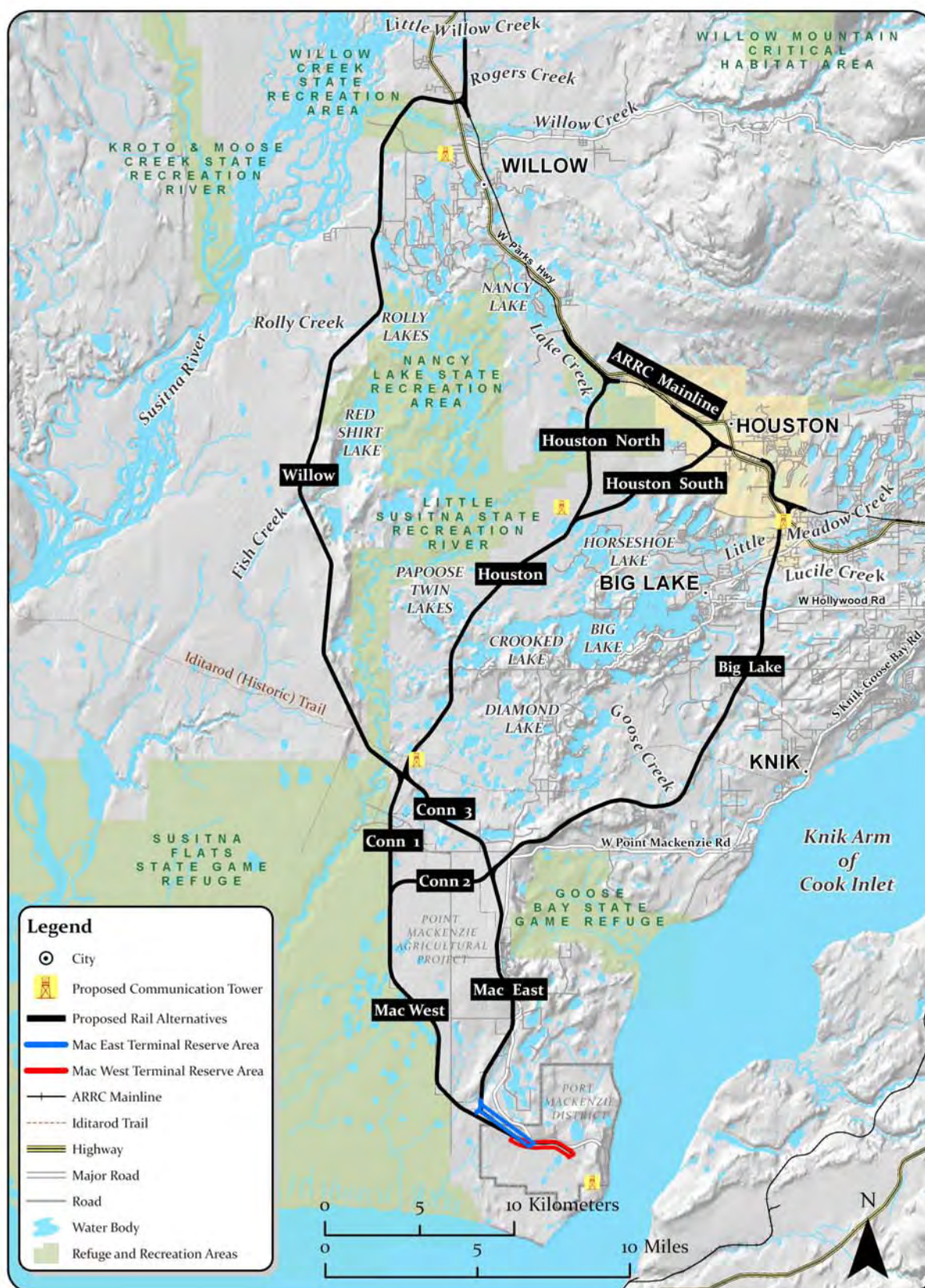


Figure G-1. Overview Map of Project Alternatives Evaluated

The project potentially crosses Willow Creek and Fish Creek – Susitna River drainages; the Little Susitna River drainage; Lucile Creek, Fish Creek, and Goose Creek – Knik Arm drainages; and several other small Cook Inlet drainages (Figure G-1). Rail bridges and culverts would be required for crossing important EFH-bearing waterbodies. The current location, type, and size of all proposed bridges and culverts are considered approximate and preliminary, and the exact locations, types, and sizes would be determined during the final design and permitting process.

Some crossings are currently identified as “drainage structures,” which are crossings that may be a bridge or culvert, depending on final design and permitting. The Applicant has stated that all bridges and culverts would be designed to allow fish passage in accordance with Alaska Department of Natural Resources (ADNR) Title 41 Fish Habitat Permit.

## **G.2 Essential Fish Habitat**

Congress defined EFH under the Magnuson-Stevens Act for federally managed fish species as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 U.S.C. 1801-1883). Salmon species that inhabit Cook Inlet– Chinook or king salmon (*Oncorhynchus tshawytscha*), chum or dog salmon (*Oncorhynchus keta*), coho or silver salmon (*Oncorhynchus kisutch*), pink or humpy salmon (*Oncorhynchus gorbuscha*), and sockeye or red salmon (*Oncorhynchus nerka*) – are federally regulated. Therefore, the freshwater resources these species use are protected under the EFH provisions of the Magnuson-Stevens Act.

The proposed rail alternatives cross important EFH in the upper Cook Inlet: the Willow Creek, Rolly Creek and Fish Creek drainages – Susitna River tributaries; the Little Susitna River drainage; the Big Lake drainage, the Goose Creek drainage and drainages in the East Susitna Flats. These drainages support between one and five of the federally managed salmon species.

Figure G-2 shows streams documented as supporting EFH-protected fisheries in the study area (Johnson and Daigneault, 2008). Salmon runs in the study area begin in May as Chinook salmon travel upstream to spawn and continue through September when coho salmon spawn throughout area streams (Table G-1). All salmon require freshwater spawning habitats (Table G-2).

All five Pacific salmon are commercially harvested in the Upper Cook Inlet (ADF&G, 2007b). Typically, the Upper Cook Inlet salmon harvest is about 5 percent of the statewide commercial salmon harvest, and is harvested by nearly 10 percent of all holders of statewide salmon permits (Shields, 2007). The commercial salmon harvest in Upper Cook Inlet has ranged from 1.8 to 5.7 million fish, primarily sockeye salmon, with a 10-year average of 3.5 million salmon per year (Table G-3). In the study area, the salmon harvest in 2007 in Alaska Department of Fish and Game (ADF&G) Upper Cook Inlet Fisheries Management Subdistricts 247-41, 247-42, and 257-50 represented less than 1 percent of the Upper Cook Inlet harvest (Shields, 2007).

Chinook salmon stocks in late May are the earliest run of salmonids that provide Upper Cook Inlet commercial fishing opportunity. As the season progresses, sockeye, chum, and coho salmon also become available to commercial fisheries, and commercial fishing continues throughout the summer. The ADF&G monitors salmon stocks returning to index streams in the







**Table G-1**  
**Salmon Spawning Run Timing within the Port MacKenzie Rail Extension Study Area<sup>a</sup>**

Salmon and Streams	May	June	July	August	September
<b>Chinook Salmon</b>					
Parks Highway Streams					
Susitna River Streams					
The Little Susitna River					
Lower					
Upper					
<b>Chum Salmon (less abundant)</b>					
Susitna River Streams					
<b>Coho Salmon</b>					
Parks Highway Streams					
Susitna River Streams					
The Little Susitna River					
Lower					
Upper					
<b>Pink Salmon (abundant in even years)</b>					
Susitna River Streams					
<b>Sockeye Salmon</b>					
Susitna River Streams					
The Little Susitna River					

<sup>a</sup> Source: ADF&G, 2009a.

**Table G-2**  
**Salmon Habitat and Ecology<sup>a</sup> (page 1 of 2)**

Common Name (Species)	Spawning Habitats/ Rearing Habitats	Overwinter Habitats	Ecology
Chinook Salmon ( <i>Oncorhynchus tshawytscha</i> )	Spawn in fast deep water over gravelly or rocky bottoms of clearwater streams where they can dig redds; fry and juveniles use sloughs, backwaters, tributaries, shallows along gravel bars and beaver ponds. Can rear for 1-3 years in fresh water.	Overwinter as eggs or juveniles. Can be found in Willow Creek and the Little Susitna River.	Juveniles smolt and outmigrate in spring following hatching, and outmigration appears to occur soon after ice breakup, peaking in mid to late May. Extensive movement within the river system in the first year of life, adults return to spawn after 4- to 5-year marine residence.
Chum Salmon ( <i>Oncorhynchus keta</i> )	Spawn in small side channels and areas of larger rivers with upwelling springs; fry emerge from the gravel in spring and immediately outmigrate downriver, feeding on small insects and other detritus.	Overwinter as eggs.	Fry emerge from the gravel in early to mid April, with peak outmigration before the end of May. Adults return to spawn after 3- to 5-year marine residence (adults infrequently found in study area).
Coho Salmon ( <i>Oncorhynchus kisutch</i> )	Spawn in gravel areas of clearwater habitats, usually spring-fed; juveniles use ponds, and pools in streams and rivers or stream margins, usually among submerged woody debris and in scour pools.	Juveniles overwinter near springs and in spring-fed streams; areas with upwelling are important for both egg and fry survival.	Spend 1 to 3 years in streams, spend 1 year in marine waters before returning. Sizeable run in the Little Susitna River.

**Table G-2**  
**Salmon Habitat and Ecology<sup>a</sup> (page 2 of 2)**

<b>Common Name (Species)</b>	<b>Spawning Habitats/ Rearing Habitats</b>	<b>Overwinter Habitats</b>	<b>Ecology</b>
Pink Salmon ( <i>Oncorhynchus gorbuscha</i> )	Spawn in the lower reaches of freshwater streams in shallow riffles over coarse gravel; eggs hatch midwinter in the gravel and emerge in late winter to migrate to marine waters.	Eggs in the gravel until spring; do not overwinter as juveniles in Southcentral Alaska.	Two-year cycle that is stronger on even years; can be found in most area streams during summer migration.
Sockeye salmon ( <i>Oncorhynchus nerka</i> )	Usually spawn in rivers and streams and upwelling areas along lake beaches. Eggs hatch during winter and young emerge and move into rearing areas along lakes and streams.	Juveniles use deeper large lakes for overwintering.	In stream systems with large lakes; spawning in streams and rivers, will occur in backwater sloughs or oxbows. The Fish Creek-Big Lake drainage has a moderate run of sockeye salmon.

<sup>a</sup> Source: ADF&G, 2007a; 2007b; 2009a; Mecklenburg *et al.*, 2002.

**Table G-3**  
**Upper Cook Inlet Commercial Salmon Harvest 1997 to 2007<sup>a</sup>**

<b>Year</b>	<b>Chinook</b>	<b>Sockeye</b>	<b>Coho</b>	<b>Pink</b>	<b>Chum</b>	<b>Total</b>
1997	13,292	4,176,738	152,404	70,933	103,036	4,516,403
1998	8,124	1,219,242	160,660	551,260	95,654	2,034,940
1999	14,383	2,680,510	125,908	16,174	174,541	3,011,516
2000	7,350	1,322,482	236,871	146,482	127,069	1,840,254
2001	9,295	1,826,833	113,311	72,559	84,494	2,106,492
2002	12,714	2,773,118	246,281	446,960	237,949	3,717,022
2003	18,490	3,476,159	101,756	48,789	120,767	3,765,961
2004	27,476	4,926,220	311,056	357,939	146,164	5,768,855
2005	28,171	5,238,168	224,657	48,419	69,740	5,609,155
2006	18,029	2,192,730	177,853	404,111	64,033	2,856,756
2007	17,625	3,316,779	177,339	147,020	77,240	3,736,003
Average, 1997 – 2006	15,732	2,983,220	185,076	216,363	122,345	3,522,736

<sup>a</sup> Source: Shields, 2007.

study area for salmon escapement (adult salmon returning to spawning grounds – or those that have “escaped” harvest) to ensure sustainability of salmon stocks (Table G-4).

The Susitna River is the largest salmon-producing stream in the ADF&G Upper Cook Inlet Fisheries Management Northern District. Proposed rail alternatives would cross four tributaries to the main-stem Susitna River – Rodgers Creek (a tributary to Little Willow Creek), Willow Creek, Rolly Creek (upstream from EFH) (Johnson and Daigneault, 2008), and Fish Creek.

Salmon stocks from the Susitna River and its tributaries are an important component of commercial fishery in Northern Cook Inlet, although the contribution of Willow Creek, Rodgers Creek, and Fish Creek stocks to the Susitna River salmon stocks is not known (Tobias and Willette, 2008).

Salmon stocks in streams that the proposed Port MacKenzie Rail Extension segments would cross contribute to commercial, recreational, subsistence, and personal-use fisheries. In the study area, Chinook salmon stocks are found in Little Willow Creek, Willow Creek, the Little Susitna

**Table G-4**  
**Salmon Escapement in Index Streams in the Port MacKenzie Rail Extension Study Area<sup>a</sup>**

System	Sustainable Escapement Goals		Escapements			
	Data Source	Range	2004	2005	2006	2007
<b>Chinook Salmon</b>						
The Little Susitna River	Single aerial survey index	900 to 1,800	1,694	2,095	1,855	1,731
Little Willow Creek	Single aerial survey index	450 to 1,800	2,227	1,784	816	1,103
Willow Creek <sup>b</sup>	Single aerial survey index	1,600 to 2,800	2,985	2,463	2,217	1,373
<b>Coho Salmon</b>						
The Little Susitna River	Weir <sup>c</sup>	10,100 to 17,700	40,199	16,839	8,786	17,573
<b>Sockeye Salmon</b>						
Fish Creek (Big Lake)	Weir	20,000 to 70,000	22,157	14,215	32,562	27,948

<sup>a</sup> Sources: Shields, 2007; Tobias and Willette, 2008.

<sup>b</sup> Willow Creek escapement includes hatchery fish.

<sup>c</sup> Weir washed out of the Little Susitna River in 2005 and 2006; counts were incomplete.

River, and Fish Creek – Big Lake drainage. Chum salmon are found infrequently in the study area, with spawning stocks of unknown size in the Little Willow Creek, Willow Creek, the Little Susitna River, Little Meadow Creek and Fish Creek – Big Lake drainage. Chum salmon are harvested incidentally to the catch of other salmon. Coho salmon stocks can be found in most streams in the study area. Pink salmon stocks are found in the study area in Little Willow Creek, Willow Creek, the Little Susitna River, an unnamed tributary of the Little Susitna River, Little Meadow Creek, and Fish Creek – Big Lake drainage. Pink salmon are harvested as part of the overall commercial catch, but are not targeted by Upper Cook Inlet fisheries. Sockeye salmon stocks from the Fish Creek – Big Lake drainage, the Little Susitna River, Little Meadow Creek, Lucile Creek, and Fish Creek – Susitna River drainage all contribute to commercial and subsistence harvests. Stocks of sockeye salmon can be sizeable when reproduction is successful. In recent decades, stocks of native sockeye salmon have been of concern due to overstocking of hatchery fish, degradation of habitat, and predation by non-native northern pike (*Esox lucius*).

There are two subsistence fisheries south of the study area (the Tyonek and Yentna rivers fisheries) and two personal-use fisheries in the study area on the Fish Creek-Big Lake drainage (Shields, 2007). The Fish Creek personal-use dip-net fishery sustained an annual mean harvest of 9,700 sockeye salmon from 1987 to 2001 (Shields, 2007). The ADF&G closed the Fish Creek dip-net fishery by Emergency Order in 2001 due to declining escapements and reduction in stocking levels, but could reopen the fishery when escapements are projected to be above 70,000 sockeye salmon (ADF&G, 2009a). However, sockeye salmon escapements have been below 50,000 since 2004 (Table G-4).

## **G.3 Effects of the Proposed Project on Essential Fish Habitat**

Rail line construction would require multiple stream crossings at locations that have EFH. Project construction methods and timing, the type of stream crossing structure installed, and daily operations procedures would influence the severity and types of impacts to fish and fish habitat at each stream crossing. The primary potential impacts of crossing structures to fish and fish habitat would be loss and degradation of instream habitats due to placement of structures, alteration of stream hydrology and water quality, and blockage of movements. Each stream crossing would result in site-specific impacts to aquatic and riparian habitats. Stream channel characteristics such as area of runs, glides, riffles, and pools; water velocities; channel substrates such as cobble, gravel, sand, and silt; bank morphology and composition; water quality; bank vegetation; and unblocked access interact to determine salmon use and habitat suitability for eggs, larvae, and juvenile or adult salmon. The general type of crossing structure; that is, bridge or culvert, used at a crossing would also influence potential impacts to fish and fish habitat through habitat loss, alteration, degradation, and access.

### **G.3.1 Methodology**

SEA analyzed potential impacts to EFH fisheries resources from proposed rail line construction and operations for each crossing based on current and potential salmon use; existing habitats; salmon habitat requirements; salmon seasonal movement patterns; proposed conveyance types and sizes; potential stream blockage; and the stream contributions to important recreational, commercial, or subsistence/personal-use salmon fisheries. SEA based the analysis of potential instream fish habitat on the review of stream-crossing characteristics and reported salmon presence and habitat use data (Johnson and Daigneault, 2008); and fish habitat data collected at or near proposed stream crossings during SEA field investigations in 2008 (Noel *et al.*, 2008). Streams are determined to contain EFH if they are cataloged anadromous waters (Johnson and Daigneault, 2008), or if EFH was determined to be present during SEA stream-crossing investigations in 2008 (Noel *et al.*, 2008).

The Applicant performed a hydrologic review of the study area to identify surface water resources, including pre- and post-project drainage patterns, flow rates, and floodplain limits and encroachments. This review also included a preliminary determination of the types and sizes of conveyance structures for many of the anticipated water crossings. Channel-width data collected during 2008 field studies conducted by SEA at fish-bearing stream crossings were found to not always match the size of the conveyance structure determined during the earlier preliminary design (Noel *et al.*, 2008). SEA determined that it would not be reasonable to use the potential impacts that would be anticipated for these undersized structures to distinguish between alternatives because the hydrologic review and Applicant-proposed conveyance structures are preliminary, and the final conveyance structure types and sizes would be determined during final permitting and design. ARRC would base final conveyance structure designs on the reasonable terms, conditions, and design criteria that would result from the ADF&G Fish Habitat permit that would likely ensure a conveyance structure size similar to the channel width to maintain flow conditions suitable for fish passage.

## **G.3.2 Common Impacts**

Rail line construction would result in short-term disturbance and potential long-term salmon habitat loss and modification at stream crossings along the approximately 35 to 40 miles of rail line. The following paragraphs describe the types of potential construction-related impacts to salmon and salmon habitats that would be common to all proposed rail line stream crossings.

### **G.3.2.1 Loss or Alteration of Instream and Riparian Habitats**

During construction, there would be a temporary loss of instream habitat where water was diverted from the existing stream channel to facilitate installation of bridge pilings, bank armoring, or culverts. Bridge abutments or instream pilings, armoring around abutments and nearby banks, and installation of instream culverts would remove streambed and shoreline areas that would otherwise be available for fish use. Bridge and culvert installation would cause the loss of rearing, foraging, and cover habitat along the banks; scouring of spawning areas through removal of instream large woody debris; loss of overhanging bank habitat structure and vegetation; and alteration of stream flows.

During construction, the riparian corridor would be cleared of vegetation as necessary for bridge, culvert, rail, and access road construction. Riparian corridors along stream banks provide important instream habitat protection from stream bank erosion and sedimentation. Stream bank vegetation moderates stream temperature in summer, provides cover for fish to hide from predators, and provides a velocity refuge for juvenile fish (Marcus *et al.*, 1990). Removal of riparian vegetation and disturbance to stream banks could contribute to increased erosion, increased sediment loading to the stream, increased turbidity, elevated water temperatures, reduced productivity, and a reduction in overall habitat complexity (Hicks *et al.*, 1991; Waters, 1995). Sedimentation resulting from construction activities could temporarily adversely affect juvenile fish, eggs, and larvae in nearby spawning beds and invertebrate forage production (Waters, 1995).

### **G.3.2.2 Mortality from Instream Construction**

During construction, there could be direct mortality of fish when equipment is driven through a streambed. Redds, eggs, and fry within or downstream of the construction site could be lost or their viability reduced through sedimentation, excessive vibration, and scour caused by construction equipment. Movement of construction equipment could cause compaction of the soils and gravels in the streambed, resulting in the death of larval fish and eggs. In areas where there is a soft sediment bottom, equipment movement could create areas that redirect stream flow, and portions of the streambed could become dry and isolated, resulting in mortality of fish as they become isolated from free-flowing waters. Water diversions and temporary dewatering could also impact developing eggs and pre-emergent fry (Becker *et al.*, 1982; Becker *et al.*, 1983; Holland, 1987) through desiccation or freezing. Eggs, larvae, and juvenile fish would be more susceptible to mortality from instream construction because larger fish would be expected to avoid equipment and could move away from the construction area.

### **G.3.2.3 Blockage of Fish Movement**

Depending on timing, construction-related activities could block fish movements. Construction methods that depend on water diversions during open-water construction could create temporary physical barriers to fish passage or alter stream flows sufficiently to create either high- or low-water conditions that prevent fish movements within and between lakes, tributaries, and rivers to rearing or spawning habitats. Connectivity between tributaries and mainstem habitats is particularly important for maintaining productivity of juvenile salmonids (Bramblett *et al.*, 2002). Instream construction could reduce stream flows sufficiently to block upstream migration of adult salmon or displace juvenile or small fish from rearing and foraging habitats due to high flows. Blocked spawning fish might attempt to use inadequate spawning areas, which could result in uncertain survival of eggs, larvae, and juvenile fish, and ultimately could result in reduced productivity. Winter construction supported by ice bridges could cause blockage of stream flow and over-ice flooding near the crossing in spring, restricting movements of salmon between lake, tributary, mainstem, and marine rearing or spawning habitats.

### **G.3.2.4 Degradation of Water Quality**

Clearing of vegetation from the ROW, grading, construction of access roads, and placement of bridges and culverts would expose soil to erosion from wind, rain, stream-flow, and runoff. Erosion delivers sediment to streams, which can degrade water quality and reduce fish habitat quality and productivity through sedimentation and turbidity (Waters, 1995). While increased erosion and sedimentation might be temporary during construction, increased fine sediments reduce oxygen exchange, which results in lower survival of eggs and larvae in spawning gravels (Grieg *et al.*, 2005). High turbidity could result in avoidance behavior, reduced foraging success in sight-feeding fish (Barrett *et al.*, 1992), induced physiological stress, and increased mortality (Waters, 1995).

Fuel leaks from construction equipment could reduce water quality and result in toxic affects to fish and aquatic invertebrate forage. Spills and leaks could enter the water either directly as equipment crossed streams or indirectly with runoff from bridges and adjacent roadbeds or railbeds.

### **G.3.2.5 Alteration of Stream Hydrology and Ice Breakup**

Construction activities could cause changes in flow patterns through the hyporheic zone, the region beneath a stream bed where there is mixing of shallow groundwater and surface water. Excavation and vegetation clearing would dislodge fine sediments that could infiltrate the hyporheic zone and clog interstitial spaces, and vibrations from construction equipment can cause substrates to settle and become compacted (Sear, 1995; Huggenberger *et al.*, 1998). Hyporheic flow and groundwater upwelling (springs) are important in salmonid egg development (Baxter and McPhail, 1999; Brown and Mackay, 1995). There could be permanent changes in subsurface flow from bank and substrate armoring, instream support structures, and changes in channel morphology caused by bridges and culverts interrupting lateral stream migration.

ARRC might use ice bridges to provide a means of moving equipment across streams during the winter construction period. Ice bridges are made by thickening and sometimes grounding ice across the stream. The thickened ice melts more slowly than the stream ice and during spring breakup could contribute to the formation of ice dams. Ice dams can also form in areas where bridges and culverts constrict stream channels. Ice dams could cause scour of the streambed and erosion along the upstream side of affected streams. The movement of the ice and rush of water when the dam fails could damage spawning beds.

### **G.3.2.6 Noise and Vibration Impacts**

Depending on the timing of construction, there could be potential impacts to salmonids from underwater pile driving noise and vibration during bridge construction. Exposure to pile driving vibration and noise could displace juvenile fish, trigger avoidance behavior, and disrupt fish sense of hearing and the function of the lateral line, the sensory organ that detects vibration (Hastings et al., 1996; McCauley et al, 2003). Whereas it is possible that fish could swim away from a sound source, thereby decreasing exposure to sound, eggs are often stationary or move very slowly and could be exposed to extensive human-generated sound if it is presented in the surrounding water column or substrate. However, data are limited or inconclusive concerning the effects of sound, including pile driving noise, on developing eggs (Hastings and Popper, 2005; California Department of Transportation, 2009). The few studies on the effects on fish eggs, larvae, and fry are insufficient to reach any conclusions with respect to the way sound would affect survival (Hastings and Popper, 2005).

### **G.3.3 Operations Impacts**

Many potential impacts to stream crossings initiated during construction would continue to contribute to impacts to fisheries resources during rail line operations. Operations-related impacts would be common for all stream crossings along the proposed rail line.

#### **G.3.3.1 Loss or Alteration of Instream and Riparian Habitats**

Bridges that have abutments or pilings in the streambed cause permanent losses of fish spawning and rearing habitats, as discussed above. Instream bridge supports lead to upstream scour and downstream bed-load deposition, which extends the area of instream habitat the structure affects. Bridges and open-bottom culverts also create shade that results in degradation and loss of overhanging riparian vegetation that juvenile fish use for cover and forage. Bridges typically require placement of riprap, which permanently displaces vegetation that filters runoff, resulting in a permanent loss of juvenile rearing habitat along the hardened bank beneath the bridges (Schmetterling *et al.*, 2001; Fischenich, 2003).

Culverts placed directly in the streambed cause permanent loss of any existing spawning and rearing habitats, alter stream flow and stream bottoms on either end of the culverts, and change adjacent riparian habitat. When culverts are installed, fill is usually placed around the culvert, and streambanks upstream and downstream of the culvert are reinforced with riprap. During high-water events, water can bypass improperly sized culverts and create scour pools, causing additional streambank erosion. As erosion continues over time, there can be additional loss of habitat as more riprap is added.

Bridge abutments and culverts could impede the transport of large woody debris, which provides rest areas, shade, and cover for fish and substrate for aquatic vegetation and invertebrates (House and Boehne, 1986; Marcus *et al.*, 1990). When large woody debris blocks conveyance structures, the debris is typically removed from the stream system and placed beyond the flood plain, resulting in permanent loss of this habitat structure and an interruption in the downstream transport of large woody debris.

Culverts placed in the soft substrate across wetlands could sink over time, creating ponds on the upslope side of the railbed and drying on the down slope side of the railbed. If a culvert blocks water flow, nutrients would no longer be cycled through wetlands to receiving waters, which would affect nutrient input to aquatic plants and animals that provide forage for fish. If surface water exchange between wetlands and streams was interrupted, stream flows could be reduced and riparian vegetation along the stream corridor could begin to decline, which would result in erosion, bank sloughing, and increased sedimentation during high-water conditions.

#### **G.3.3.2 Blockage of Fish Movement**

Improperly embedded and maintained culverts and the surrounding fill could change the ability of the culvert to convey water. Flooding levels exceeding the culvert design could result in the culvert becoming more deeply embedded in the streambed, and over time the culvert opening could become inefficient at passing fish to upstream habitats. Habitat loss would increase as culverts failed and fish movements were blocked, preventing fish populations from accessing upstream and downstream habitats.

Bridges and culverts could also create constrictions, restricting the downstream movement of large woody debris important for productive salmonid habitats (House and Boehne, 1986), or ice, causing ice jams and flooding. Water in undersized culverts often freezes solid and is slow to melt due to the insulation of road or rail embankments, blocking spring movements of fish to foraging and spawning habitats.

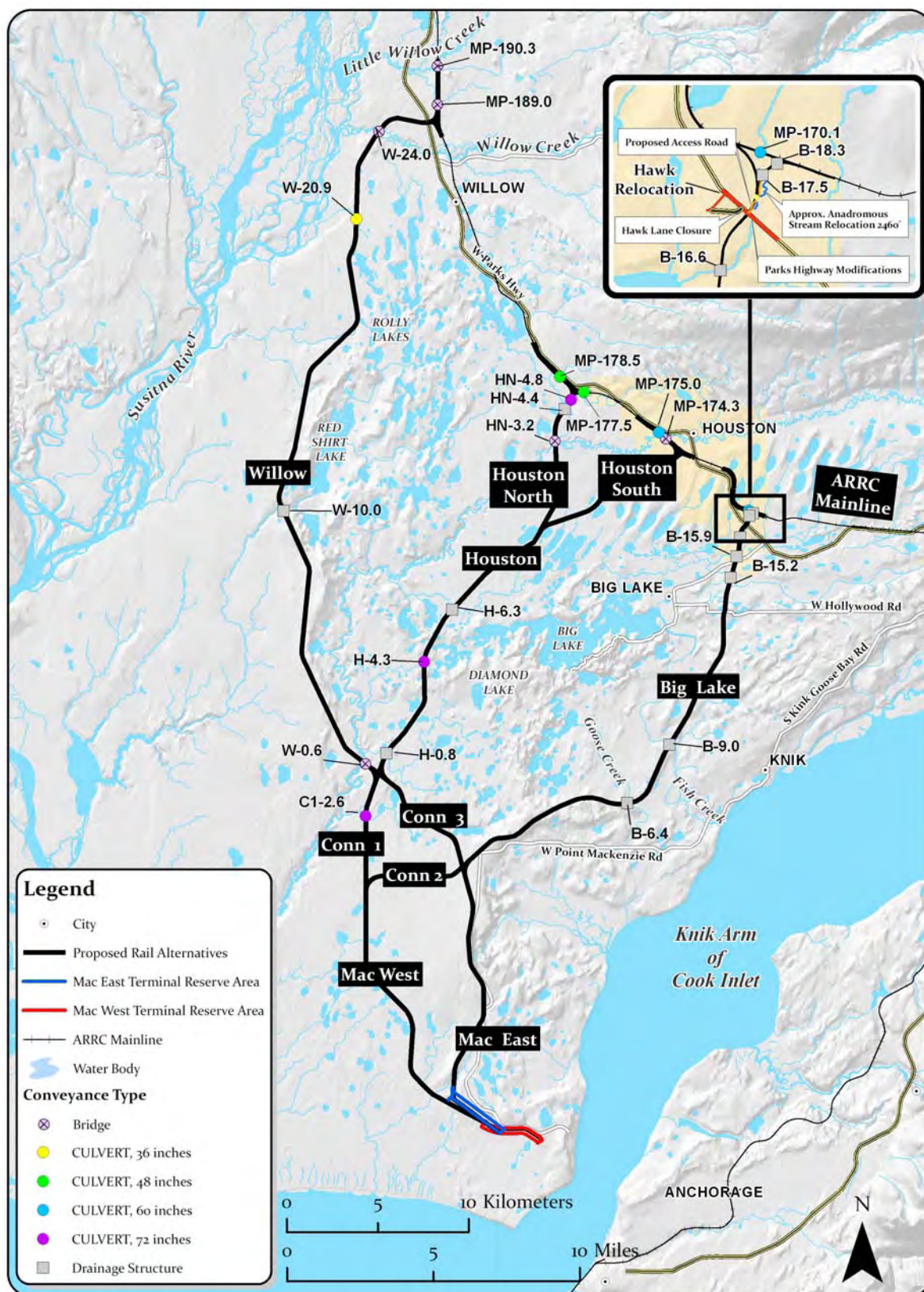
#### **G.3.3.3 Degradation of Water Quality**

Maintenance activities such as clearing drainage ditches and management of vegetation in the ROW could cause an increase in turbidity and sedimentation over natural background levels in streams. ARRC does not propose to transport hazardous materials along the proposed Port MacKenzie Rail Extension; however, spills of nontoxic bulk materials could have physical impacts if spills occurred at or near stream crossings.

### **G.3.4 Impacts by Segment and Segment Combinations**

Most segments and segment combinations would cross streams or waterbodies providing EFH that could be affected by proposed rail line construction and operations (Figure G-3; Table G-5). The paragraphs below describe notable site-specific potential impacts to EFH habitats by rail line segment. Potential impacts to EFH by segment are summarized in Table G-6.





**Figure G-3. Crossing Methods for EFH-Bearing Streams Crossed by the Port MacKenzie Rail Extension Project (Johnson and Daigneault, 2008; Noel et al., 2008)**

**Table G-5**  
**EFH-Bearing Streams Crossed by the Proposed Port MacKenzie Rail Extension Project<sup>a</sup> (page 1 of 3)**

Segment/Crossing Location	Crossing Identification	Stream Name	Alaska Department of Fish and Game Anadromous Catalog Number <sup>b</sup>	Waterbody Type
<b>SOUTHERN SEGMENTS</b>				
<b>Connector 1 Segment</b>				
C1-2.6	C1-026	The Little Susitna Tributary	247-41-10100-2080: COpr	Stream
<b>NORTHERN SEGMENTS</b>				
<b>Willow Segment</b>				
MP-190.3	W-098	Little Willow Creek Tributary <sup>d</sup>	0.2 mile upstream from COR	Stream
MP-189.0	W-101R	Rodgers Creek	247-41-10200-2130-3020: COR	Stream
W-24.0	W-106	Willow Creek	247-41-10200-2120: CHs, COsr, Ksr, Ps	Stream
W-20.9	W-110	Susitna River Tributary <sup>e</sup>	Nominated	Stream
W-10.0	W-118R	Fish Creek	247-41-10200-2020: COR, Sp	Stream
W-0.6	W-121R	The Little Susitna River	247-41-10100: CHs, COs, Ks, Ps, Sp	Stream
<b>Houston North Segment</b>				
MP-178.5	HN-065R	Lake Creek Tributary	247-41-10100-2231-3026: COR	Stream
MP-177.5	None	Lake Creek Tributary	247-41-10100-2231-3018-4011: COR	Stream
HN-4.8	HN-122R	Lake Creek Tributary	247-41-10100-2231-3018: COR	Stream
HN-4.4	HN-123	Lake Creek	247-41-10100-2231: COR, Sp	Stream
HN-3.2	HN-067R	The Little Susitna River	247-41-10100: CHs, COs, Kp, Ps, Sp	Stream
<b>Houston South Segment</b>				
MP-175.0	HS-070R	The Little Susitna Tributary	247-41-10100-2255: COR	Stream
MP-174.3	HS-071R	The Little Susitna River	247-41-10100: CHp, COs, Ks, Ps	Stream
<b>Houston Segment</b>				
H-6.3	H-044	The Little Susitna Tributary	247-41-10100-2150: COR	Stream
H-4.3	H-046	The Little Susitna Tributary	247-41-10100-2100: COR, Kr	Stream
H-0.8	H-050R	The Little Susitna Tributary	247-41-10100-2090: Ps, COsr	Stream
<b>Big Lake Segment</b>				
MP-170.1	BL-003	Outlet Cheri Lake	247-50-10330-2050-3025: COR	Stream
B-18.3	None	Inlet to Long Lake	247-50-10330-2050-3025: COR	Stream
B-17.1 to B-17.6	None	Inlet to Long Lake	247-50-10330-2050-3025: COR	Stream
B-16.6	BL-007R	Inlet to Long Lake	247-50-10330-2050-3025: COR	Stream
B-15.9	BL-008	Little Meadow Creek	247-50-10330-2050-3050: CHp, COrs, Pp, Ss	Stream
B-15.2	BL-010R	Lucile Creek	247-50-10330-2050-3030: Sp, COR	Stream
B-9.0	BL-019R	Fish Creek	247-50-10330: CHp, COrs, Kp, Ps, Sp	Stream
B-6.4	BL-022R	Goose Creek	247-50-10360: COsr, Kr	Stream

**Table G-5**  
**EFH-Bearing Streams Crossed by the Proposed Port MacKenzie Rail Extension Project<sup>a</sup> (page 2 of 3)**

Segment/Crossing Location	Fish	Channel Width (feet)	Conveyance Type <sup>c</sup>	Conveyance Size <sup>c</sup>	Habitat <sup>b</sup>				Potential Blockage <sup>b</sup>
					SP	R	M	OW	
NORTHERN SEGMENTS (cont'd)									
Connector 1 Segment									
C1-2.6	Anadromous	27	Culvert	72 inches	--	Y	Y	--	No
Willow Segment									
MP-190.3	Anadromous	12.3	Bridge	NA	Y	Y	Y	--	No
MP-189.0	Anadromous	36.3	Bridge	NA	--	Y	Y	Y	No
W-24.0	Anadromous	97.5	Bridge	NA	Y	Y	Y	Y	No
W-20.9	Anadromous	7.4	Culvert	36 inches	--	Y	Y	--	Yes - US
W-10.0	Anadromous	15	Drainage Structure	NA	Y	Y	Y	Y	No - BD
W-0.6	Anadromous	105	Bridge	NA	Y	Y	Y	Y	No
Houston North Segment									
MP-178.5	Anadromous	6.3	Culvert Extension	48 inches	--	Y	Y	--	Yes - US
MP-177.5	Anadromous	Less than 2	Culvert Extension	48 inches	--	Y	--	--	Yes - US & DS
HN-4.8	Anadromous	9	Culvert	72 inches	--	Y	--	--	Yes - US
HN-4.4	Anadromous	20	Drainage Structure	NA	--	Y	Y	--	Yes - US & DS
HN-3.2	Anadromous	97.5	Bridge	NA	Y	Y	Y	Y	No
Houston South Segment									
MP-175.0	Anadromous	14	Culvert Extension	NA	--	Y	Y	--	Yes - US
MP-174.3	Anadromous	46.5	Bridge	NA	Y	Y	Y	Y	No
Houston Segment									
H-6.3	Anadromous	16	Drainage Structure	NA	--	Y	Y	--	Yes - US
H-4.3	Anadromous	1 to 3	Culvert	72 inches	--	Y	Y	--	Yes - US & DS
H-0.8	Anadromous	14	Drainage Structure	NA	Y	Y	Y	Y	No

**Table G-5**  
**EFH-Bearing Streams Crossed by the Proposed Port MacKenzie Rail Extension Project<sup>a</sup> (page 3 of 3)**

Segment/Crossing Location	Fish	Channel Width (feet)	Conveyance Type <sup>c</sup>	Conveyance Size <sup>c</sup>	Habitat <sup>b</sup>				Potential Blockage <sup>b</sup>
					SP	R	M	OW	
NORTHERN SEGMENTS (cont'd)									
Big Lake Segment									
MP-170.1	Anadromous	1.5	Culvert Extension	60 inches	--	Y	Y	--	Yes - US & DS
B-18.3	Anadromous	<1	Drainage Structure	NA	--	Y	Y	--	Yes - US & DS
B-17.1 to B-17.6	Anadromous	<1	Stream Relocation	2,500 feet of relocation	--	Y	Y	--	Yes - US & DS
B-16.6	Anadromous	6.5	Drainage Structure	NA	--	Y	Y	--	Yes - US & DS
B-15.9	Anadromous	28	Drainage Structure	NA	Y	Y	Y	Y	Yes - US & DS
B-15.2	Anadromous	11.5	Drainage Structure	NA	--	Y	Y	Y	Yes - US & DS
B-9.0	Anadromous	28	Drainage Structure	NA	Y	Y	Y	Y	Yes - US & DS
B-6.4	Anadromous	6	Drainage Structure	NA	--	Y	Y	Y	Yes - DS

<sup>a</sup> Source: Johnson and Daigneault, 2008; Noel *et al.*, 2008.

<sup>b</sup> Anadromous catalog codes: K = Chinook salmon, CH = chum salmon, CO = coho salmon, P = pink salmon, S = Sockeye salmon, p = present, r = rearing, s = spawning. Kr = Chinook rearing observed but not noted in Alaska Department of Fish and Game Anadromous Catalog. Habitat abbreviations: Rearing (R), Migration (M), Over-wintering (OW), Spawning (SP) and habitats for Chinook, chum, coho, pink or sockeye salmon: Y = verified, -- = not present, P = probable. Potential Blockage abbreviations: BD = beaver dam, US = artificial - up stream, DS = artificial - down stream.

<sup>c</sup> Culverts are closed cylindrical structures; size is diameter. Culvert extension is an extension of an existing culvert. Drainage structures could include multiplate culverts, precast arches, or single or multiple short-span bridges; type and size to be determined during final design and permitting. Bridges are single or multiple 23-foot short-span bridges. (HDR Alaska, Inc., and TNH-Hanson, LLC, 2008; Pochop, 2008). NA = Not Available.

<sup>d</sup> Spawning substrates, adult coho salmon and juvenile salmonids observed (Noel *et al.*, 2008).

<sup>e</sup> Nominated for the Anadromous Stream Catalog based on data from survey (Noel *et al.*, 2008).

**Table G-6**  
**Summary of EFH-Bearing Streams Crossed by Segments**

	<b>SOUTHERN SEGMENTS</b>		<b>NORTHERN SEGMENTS</b>		
	<b>Mac West-Connector 1</b>	<b>Willow</b>	<b>Houston-Houston North</b>	<b>Houston-Houston South</b>	<b>Big Lake</b>
EFH Crossings	1	6	8	5	8
<b>Habitat</b>					
Spawning	0	4	2	2	2
Rearing	1	6	8	5	8
Migration	1	6	8	5	8
Over-Winter	0	4	2	2	4
<b>Conveyance Structure</b>					
Bridge	0	4	1	1	0
Culvert	1	1	4	2	1
Drainage Structure <sup>a</sup>	0	1	3	2	6
Relocation	0	0	0	0	1

Source: Johnson and Daigneault, 2008; Noel *et al.*, 2008.

<sup>a</sup> Drainage structures would be determined during the final design process and could include multi-plate culverts, pre-cast arches, and single or multiple short span bridges.

#### **G.3.4.1 Southern Segments and Segment Combinations**

The southern segments would cross only one EFH-bearing stream (Figure G-3; Table G-5). The Mac West-Connector 1 Segment Combination would cross a cataloged anadromous tributary of the Little Susitna River at C1-2.6 (Table G-5). This tributary provides rearing habitat for coho salmon and likely provides migratory access to upstream spawning and rearing habitats. Table G-7 contains salmon life stages and habitats in streams that could be crossed by the project. At present, the channel is stable, with an average width of about 27 feet (Noel *et al.*, 2008: Record 26). The culvert proposed at this crossing for the access road and railbed would be buried to approximately 40 percent of its diameter where possible, eliminating the existing emergent vegetation along the stream margin and submergent vegetation in the stream channel, and fragmenting coho salmon rearing habitat (Noel *et al.*, 2008: Record 26). Substrates at the crossing site are organic debris and fines, which would not provide spawning habitat for salmonids (Noel *et al.*, 2008: Record 26). This crossing does not appear to contain habitats capable of supporting spawning or overwintering for salmon (Table G-5).

#### **G.3.4.2 Northern Segments and Segment Combinations**

The northern segments and segment combinations would cross EFH-bearing streams at 24 locations (Figure G-3; Tables G-5 and G-6). The Willow Segment would cross the Little Susitna River and the Susitna River drainages, including six streams that support EFH. The Houston-Houston North Segment Combination would cross the Little Susitna River and the Little Susitna drainages, including eight crossings of streams that contain EFH. The Houston-Houston South Segment Combination would also cross the Little Susitna River and the Little Susitna drainages, including five streams with EFH. The Big Lake Segment would cross the Big Lake and Goose Creek drainages, including eight crossings of streams with EFH. Of the 24 potential northern segment crossings, conveyances could include 6 bridges, 7 culverts, 10 drainage structures, and

**Table G-7**  
**Salmon Life Stages and Habitats at EFH-Bearing Streams Crossed by the Proposed Port**  
**MacKenzie Rail Extension Segments<sup>a,b</sup> (page 1 of 3)**

Segment/Crossing Location	Fish Presence	Crossing Identification	Record Number	Life Stages					Habitats		
				Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging
SOUTHERN SEGMENTS											
Connector 1 Segment											
C1-2.6	<u>The Little Susitna Tributary</u>	C1-026	26								
	Coho salmon					X	X		X		X
NORTHERN SEGMENTS											
Willow Segment											
MP-190.3	<u>Little Willow Creek Tributary<sup>c</sup></u>	W-098	98								
	Coho salmon			X	X	X	X	X	X		X
MP-189.0	<u>Rogers Creek</u>	W-101R	101								
	Coho salmon					X	X		X	X	X
W-24.0	<u>Willow Creek</u>	W-106	106								
	Chinook salmon			X	X	X	X	X	X	X	X
	Coho salmon			X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X			X
	Chum salmon			X	X		X	X			X
W 20.9	<u>Susitna River Tributary<sup>d</sup></u>	W-110	110								
	Coho salmon				X	X		X		X	X
W-10.0	<u>Fish Creek</u>	W-118R	118								
	Coho salmon			X	X	X	X	X	X	X	X
	Sockeye salmon				X		X				X
W-0.6	<u>The Little Susitna River</u>	W-121R	121								
	Chinook salmon			X	X	X	X	X	X	X	X
	Sockeye salmon				X		X				X
	Coho salmon			X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X		X	X
	Chum salmon			X	X		X	X		X	X
Houston North Segment											
MP 178.5	<u>Lake Creek Tributary</u>	HN-065R	65								
	Coho salmon					X	X		X		X
MP 177.5	<u>Lake Creek Tributary</u>	None									
	Coho salmon					X	X		X		X
HNM-4.8	<u>Lake Creek Tributary</u>	HNM-122R	122								
	Coho salmon					X	X		X		X

**Table G-7**  
**Salmon Life Stages and Habitats at EFH-Bearing Streams Crossed by the Proposed Port**  
**MacKenzie Rail Extension Segments<sup>a,b</sup> (page 2 of 3)**

Segment/Crossing Location	Fish Presence	Crossing Identification	Record Number	Life Stages				Habitats			
				Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging
NORTHERN SEGMENTS (cont'd)											
Houston North Segment (cont'd)											
HN-4.4	Lake Creek	HN-123	123								
	Coho salmon					X	X		X		X
	Sockeye salmon				X		X				X
HN-3.2	The Little Susitna River	HN-067R	67								
	Chinook salmon					X	X		X	X	X
	Sockeye salmon						X				X
	Coho salmon			X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X		X	X
	Chum salmon			X	X		X	X		X	X
Houston South Segment											
MP- 175.0	The Little Susitna Tributary	HS-070R	70								
	Coho salmon					X	X		X		X
MP-174.3	The Little Susitna River	HS-071R	71								
	Chinook salmon					X	X		X	X	X
	Sockeye salmon						X				X
	Coho salmon			X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X		X	X
	Chum salmon			X	X		X	X		X	X
Houston Segment											
H-6.3	The Little Susitna Tributary	H-044	44								
	Coho salmon					X	X		X		X
H-4.3	The Little Susitna Tributary	H-046	46								
	Chinook salmon					X			X		X
	Coho salmon					X			X		X
H-0.8	The Little Susitna Tributary	H-050R	50								
	Coho salmon			X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X		X	X
Big Lake Segment											
MP-170.1	Outlet Cheri Lake	BL-003	3								
	Coho salmon					X	X		X		X
B-18.3	Inlet to Long Lake	None									
	Coho salmon					X	X		X		X

**Table G-7**  
**Salmon Life Stages and Habitats at EFH-Bearing Streams Crossed by the Proposed Port**  
**MacKenzie Rail Extension Segments<sup>a,b</sup> (page 3 of 3)**

Segment/Crossing Location	Fish Presence	Crossing Identification	Record Number	Life Stages					Habitats		
				Eggs	Fry/Larvae	Juveniles	Adults	Spawning	Rearing	Over-wintering	Summer Foraging
NORTHERN SEGMENTS (cont'd)											
Big Lake Segment (cont'd)											
B-17.1 TO B-17.6	<u>Inlet to Long Lake</u>	None									
	Coho salmon					X	X		X		X
B- 16.6	<u>Inlet to Long Lake</u>	BL-007R	7								
	Coho salmon					X	X		X		X
B-15.9	<u>Little Meadow Creek</u>	BL-008	8								
	Coho salmon			X	X	X	X	X	X	X	X
	Pink salmon						X				X
	Chum salmon						X				X
	Sockeye salmon			X	X		X	X		X	X
B-15.2	<u>Lucille Creek</u>	BL-010R	10								
	Coho salmon					X	X		X	X	X
	Sockeye salmon						X				X
B- 9.0	<u>Fish Creek</u>	BL-019R	19								
	Chinook salmon			X	X	X	X	X	X	X	X
	Sockeye salmon			X	X		X	X		X	X
	Coho salmon			X	X	X	X	X	X	X	X
	Pink salmon			X	X		X	X		X	X
	Chum salmon			X	X		X	X		X	X
B-6.4	<u>Goose Creek</u>	BL-022R	22								
	Chinook salmon					X			X	X	X
	Coho salmon			X	X	X	X		X	X	X

<sup>a</sup> Sources: ADF&G, 2007a; 2009a; Johnson and Daigneault, 2008; Noel *et al.*, 2008.

<sup>b</sup> Evaluation based on habitat at crossing location, waterbody connectivity, reported fish occurrence, and surveyed fish occurrence.

<sup>c</sup> Nominated for the Anadromous Stream Catalog based on data from survey (Noel *et al.*, 2008).

<sup>d</sup> Suitable spawning habitat for anadromous and resident game fish present (Noel *et al.*, 2008).

one stream-bed relocation (Tables G-5 and G-6). Nine of the 24 proposed northern segment crossings would cross habitats capable of supporting spawning salmon and 11 crossings could support overwintering juvenile salmon or eggs (Tables G-5 through G-7).

### G.3.4.3 Willow Segment

The Willow Segment would cross four waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including Rodgers Creek, Willow Creek, Fish Creek – Susitna River tributary, and the Little Susitna River. This segment would cross six



stream crossings with waters supporting EFH; four crossings documented as important for salmon, one crossing that has been nominated as used (W-20.9), and one crossing (MP-190.3) where spawning habitat and adult salmon were observed spawning within a tributary in the floodplain of Little Willow Creek (Figure G-3; Table G-5; Johnson and Daigneault, 2008; Noel *et al.*, 2008). Spawning habitat suitable for salmon and overwintering habitats suitable for juvenile or eggs is present at four crossings.

ARRC proposes to construct bridges at four of the EFH stream crossings, a culvert at one crossing, and a drainage structure at one crossing. Two of the four bridges would likely require instream pilings within reaches of the Little Susitna River and Willow Creek with documented spawning habitat for four of five Pacific salmon. Two of these crossings (MP-190.3 and MP-189.0), at an unnamed tributary of Little Willow Creek and Rogers Creek, parallel existing crossings of the ARRC main line. Construction of similar bridges next to the existing bridges at crossings MP-190.3 (Noel *et al.*, 2008: Record 98) and MP-189.0 (Noel *et al.*, 2008: Record 101) would result in additional habitat loss and degradation at these locations. In addition, the end of the proposed rail line siding would encroach on the Little Willow Creek crossing of the main line and would result in placement of some fill into an oxbow of this creek.

The crossing of Willow Creek (W-24.0; Noel *et al.*, 2008: Record 106) would be within the Willow Creek State Recreation Area, a popular sport fishery in the study area (ADF&G, 2009b). Construction of a crossing at this location would result in loss of spawning and rearing habitat from the bridge which could also potentially intercept large woody debris input from the surrounding spruce forest. Pink salmon were observed spread out along the left bank on a spawning bed at the W-24.0 crossing location (Noel *et al.*, 2008). The section of Willow Creek at the proposed crossing supports coho salmon rearing and migration and Willow Creek supports Chinook, chum, coho, and pink salmon (Johnson and Daigneault, 2008).

Upstream about 0.4 mile from the Fish Creek crossing (W-10.0; Noel *et al.*, 2008: Record 118), habitats were observed to be suitable for salmon spawning, rearing, and overwintering; however, no fish were observed or collected. There were several active beaver dams downstream from the site, including a new dam that had caused recent overbank flooding. This section of Fish Creek supports sockeye salmon (Johnson and Daigneault, 2008). The Willow Segment would cross the Little Susitna River, which is a stable productive system that supports all five Pacific salmon. Approximately 0.5 mile upstream of the proposed crossing site (W-0.6), there are habitats suitable for salmon spawning, rearing, migration, and overwintering (Noel *et al.*, 2008: Record 121). This section of the Little Susitna River supports spawning habitat for coho and pink salmon, rearing habitat for coho salmon, and migration habitat for Chinook, chum, and sockeye salmon (Johnson and Daigneault, 2008).

#### **G.3.4.4 Houston-Houston North Segment Combination**

The Houston-Houston North Segment Combination would cross waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including Lake Creek and the Little Susitna River, and many unnamed tributaries to these waters. Construction of this segment combination would involve crossing eight streams that provide EFH (Figure G-3; Tables G-5 and G-6). There is spawning and overwintering habitat at 25 percent of the EFH stream crossings. ARRC would construct a bridge at the Little Susitna River crossing (HN-3.2),

three drainage structures and four culverts. The bridge over the Little Susitna River would require instream pilings within a reach with documented spawning habitat for three of five Pacific salmon (Table G-5).

Crossings of streams along the existing main line (MP-178.5 and MP-177.5) might already have upstream blockages as a result of the main line, Parks Highway, or secondary road crossings (Table G-8). The main line crossing upstream of MP-178.5 would be an extension of the existing culvert, which is slightly perched above the stream bottom (Noel *et al.*, 2008: Record 65). Upstream from the crossing at MP-177.5, a secondary road might be blocking this stream. Both streams (at MP-178.5 and MP-177.5) are tributaries of Lake Creek and have been documented as providing rearing habitat for coho salmon. The channel of Lake Creek is about 20 feet wide at the proposed crossing (HN-4.4) and provides rearing habitat for coho salmon and sockeye salmon also use the channel to access Nancy Lake. This reach of Lake Creek is within the Little Susitna State Recreation River and is considered high value for fish habitat and recreational use (Noel *et al.*, 2008: Record 123).

**Table G-8**  
**Summary of EFH-Bearing Streams Crossed by Alternatives (Page 1 of 2)**

	Mac West- Conn 1- Willow	Mac West- Conn 1- Houston- Houston North	Mac West- Conn 1- Houston- Houston South	Mac West- Conn 2- Big Lake	Mac East- Conn 3- Willow	Mac East- Conn 3- Houston- Houston North	Mac East- Conn 3- Houston- Houston South	Mac East- Big Lake
<b>Fish Communities</b>								
Anadromous	7	9	6	8	6	8	5	8
<b>Habitat</b>								
Spawning	4	2	2	2	4	2	2	2
Rearing	7	9	6	8	6	8	5	8
Migration	7	9	6	8	6	8	5	8
Over-Winter	4	2	2	4	4	2	2	4
<b>Potential Blockages</b>								
None	5	3	3	0	4	2	2	0
Natural-Beaver Dams	1	0	0	0	1	0	0	0
Artificial-Up Stream	0	0	0	1	0	0	0	1
Artificial-Down Stream	1	3	2	0	1	3	2	0
Artificial-Up and Down Stream	0	3	1	7	0	3	1	7

**Table G-8**  
**Summary of EFH-Bearing Streams Crossed by Alternatives (Page 2 of 2)**

<b>Conveyance Structure</b>								
Bridge	4	1	1	0	4	1	1	0
Culvert	2	5	3	1	1	4	2	1
Drainage <sup>a</sup> Structure	1	3	2	6	1	3	2	6
Relocation	0	0	0	1	0	0	0	1
<b>Total Crossings</b>	<b>7</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>6</b>	<b>8</b>	<b>5</b>	<b>8</b>

Source: Johnson and Daigneault, 2008; Noel *et al.*, 2008.

<sup>a</sup> Drainage structures would be determined during the final design process and could include multi-plate culverts, pre-cast arches, and single or multiple short span bridges.

The Little Susitna River is a highly productive system that supports all five Pacific salmon (ADF&G, 1988). The bridge proposed for the Little Susitna River crossing would likely require instream supports to span the channel, which has a wetted width of about 100 feet at this location (Noel *et al.*, 2008: Record 67).

The Houston Segment of the Houston-Houston North Segment Combination would cross three tributaries of the Little Susitna River that support EFH (H-6.3, H-4.3, and H-0.8). Two of these tributaries, at crossings H-6.3 and H-4.3, provide access for coho salmon to Horseshoe Lake and Finger Lake, respectively; and the other tributary, at crossing H-0.8, provides spawning habitat for pink and coho salmon (Noel *et al.*, 2008: Records 44, 46, and 50).

### **G.3.4.5 Houston-Houston South Segment Combination**

The Houston-Houston South Segment Combination would cross waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including the Little Susitna River and several unnamed Little Susitna tributaries. Construction of this segment combination would involve crossing five streams that provide EFH (Figure G-3; Tables G-5 and G-6). Spawning and overwintering habitats are present at 40 percent of the EFH stream crossings. ARRC would construct a bridge over the Little Susitna River crossing (MP-174.3) next to an existing bridge. The bridge over the Little Susitna River would require instream pilings within a reach with documented spawning habitat for three of five Pacific salmon. ARRC would use two culverts and two drainage structures to cross the remaining crossings.

The existing main line crosses, and the proposed rail line would cross, a small tributary of the Little Susitna River (MP-175.0; Noel *et al.*, 2008: Record 70) that connects to an abandoned meander. This stream, which is cataloged as coho rearing habitat, appears to have been blocked upstream by construction of Parks Highway and a submerged culvert in the existing rail bed (Noel *et al.*, 2008: Record 70).

The Little Susitna River crossing (MP-174.3) would be above the river's confluence with Lake Creek and would be above the occurrence of sockeye salmon, although pink salmon spawning has been documented above this reach (Johnson Daigneault, 2008). The crossing area provides some spawning habitat, but most of the Chinook salmon in the Little Susitna River system spawn

in habitats upstream of Parks Highway (Ivey, 2009). Where the rail line would cross the Little Susitna River, meanders and oxbows parallel the existing rail line (MP-174.3; Noel *et al.*, 2008: Record 71). The proposed bridge would be just downstream of the existing rail bridge and some of these backwaters would be filled. The increased loss of riparian vegetation due to bridge construction and the filling of backwater habitats, and the increased need for bank hardening with riprap as the meandering channel continues to erode toward the existing rail bed, would decrease habitat suitability for spawning and rearing salmon.

The Houston Segment of the Houston-Houston South Segment Combination would cross three tributaries of the Little Susitna River that support EFH (H-6.3, H-4.3, and H-0.8; Table G-5). Two of these tributaries, at crossings H-6.3 and H-4.3, provide access for coho salmon to Horseshoe Lake and Finger Lake, respectively; and the other tributary, at crossing H-0.8, provides spawning habitat for pink and coho salmon (Noel *et al.*, 2008: Records 44, 46, and 50).

#### **G.3.4.6 Big Lake Segment**

The Big Lake Segment would cross waters important for sustaining recreational and commercial salmon fisheries in the Big Lake and Goose Creek drainages in Southcentral Alaska, including Little Meadow Creek, Lucile Creek, Fish Creek, and Goose Creek. Construction of this segment would involve crossing eight streams that provide EFH (Figure G-3; Tables G-5 and G-6). There is spawning habitat present at 25 percent of the crossings, and suitable overwintering habitats at 50 percent of the crossings. ARRC would construct one culvert, six drainage structures, and would fill and relocate a portion of a channel to cross EFH-bearing streams.

Five streams the Big Lake Segment would cross provide EFH habitat for coho salmon; sockeye salmon also use three of these streams (Johnson and Daigneault, 2008). One stream crossing next to the existing rail line provides connectivity for Cheri Lake (MP-170.1). ARRC would extend this existing crossing structure. The culvert at the outflow from Cheri Lake is perched above the stream bed (Noel *et al.*, 2008: Record 3). The stream that connects Cheri Lake and Long Lake is documented as coho salmon rearing habitat; the Big Lake Segment would cross this stream three times (MP-170.1, B-18.3, and B-16.6). The stream channel is not well defined and the rail bed would fill the reach between approximately Mile Post B-17.1 and Mile Post B-17.6. ARRC would relocate a 2,500-foot reach of stream channel into a new 2,400-foot-long channel. Parks Highway and two secondary roads upstream from the proposed rail line crossing at B-16.6 would also cross this stream. An existing culvert at the road crossing downstream from B-16.6 had been replaced at least once because there is a perched dry culvert and two culverts receiving flow from this stream (Noel *et al.*, 2008: Record 7). Water velocity is very slow at this location due to the improperly bedded road culverts, and it does not appear to gain sufficient velocity to provide for passage of adult salmon. With construction of the proposed Big Lake Segment there would be a total of eight crossings on the stream connecting Cheri and Long lakes and a relocation of the channel. The multiple culvert crossings appear to have reduced the capacity of this stream to provide habitat for salmon, although coho salmon were captured just above the road culvert, 400 feet downstream from the proposed rail line crossing at B-16.6 (Noel *et al.*, 2008: Record 7).

The Little Meadow Creek crossing (B-15.9) would be within a 28-foot-wide reach of the stream that provides spawning, rearing, migratory, and overwinter habitats for chum, coho, pink and

sockeye salmon. Spawning sockeye salmon were observed during the field visit, along with redds created by earlier spawning salmon (Noel *et al.*, 2008: Record 8). The proposed drainage structure could adversely impact fish if it is not designed to allow passage for juvenile and adult fish to and from upstream and downstream lakes and tributaries, and movement of stream-bed gravels. The Lucile Creek crossing (B-15.2) contains juvenile rearing and likely overwintering habitat, and a migration passage for both coho and sockeye salmon (Noel *et al.*, 2008: Record 10).

The Fish Creek drainage supports Chinook, chum, coho, pink and sockeye salmon and contributes to sockeye salmon production in the Upper Cook Inlet. The crossing location (B-9.0) supports coho rearing and sockeye migration (Noel *et al.*, 2008: Record 19). Fish Creek supports a large and complex population of salmon. It is a migratory corridor to Big Lake that supports one of the most important sockeye salmon runs in the study area. The habitat at the crossing location is complex and undisturbed, with spawning gravels and deep pools for overwintering (Noel *et al.*, 2008: Record 19).

The Goose Creek drainage supports coho salmon spawning and rearing. The crossing location (B-6.4) is within a large fen complex with the stream surrounded by floating wetland vegetation (Noel *et al.*, 2008: Record 22). This system is likely primarily groundwater fed, with a relatively stable water level that remains unfrozen during winter and provides overwintering habitat for salmon. The proposed crossing would result in the loss of about 19 acres of high-value wetland habitat due to excavation, filling, and draining of the system required for construction of the rail bed approach to the drainage structure. These construction activities would likely result in reduced productivity as fish rearing habitat for this system. A crossing at this location would likely destroy unique habitat features because the fen would either have to be drained to provide an area for construction, or the water under the floating mat vegetation would have to be channeled and filled. This wetland is likely one of the largest juvenile rearing areas, other than lakes with large shelves, in the project area.

### **G.3.5 Impacts by Alternative**

The proposed project alternatives would require a minimum of five and a maximum of nine crossings of streams that have been documented to contain EFH (Table G-8; Johnson and Daigneault, 2008; Noel *et al.*, 2008). The alternative requiring the minimum number of EFH-bearing stream crossings (5) is the Mac East-Connector 3-Houston-Houston South Alternative. The alternative requiring the maximum number of EFH-bearing crossings (9) is the Mac West-Connector 1-Houston-Houston North Alternative. Table G-8 summarizes salmon habitat use, proposed conveyance structures, and potential existing stream blockages for the 25 EFH-bearing stream crossings by alternative. Site-specific conditions at each EFH-bearing stream crossing are described in the section above.

#### **G.3.5.1 Mac West-Connector 1-Willow Alternative**

Construction of the Mac West-Connector 1-Willow Alternative would impact seven stream crossings that provide EFH (Table G-8). Spawning and overwintering habitats are present at 4 of these stream crossings. All streams this alternative would cross provide rearing habitats and salmon passage during seasonal migrations (Tables G-5 and G-8). ARRC would construct

bridges at four of the seven EFH stream crossings, construct drainage structures at one of the seven crossings, and would install culverts at two of the seven crossings (Tables G-5 and G-8). Two of the four bridges would require instream pilings within reaches of the Little Susitna River and Willow Creek, both of which contain documented spawning habitat for four of five Pacific salmon (Table G-5). Six stream crossings for this alternative would be in undeveloped areas that do not have potential unnatural blockages because of ineffective culverts or other crossing structures, although one stream has a potential beaver dam blockage (Table G-8). This alternative would cross four waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including Rodgers Creek, Willow Creek, Fish Creek (Susitna River tributary), and the Little Susitna River. Development of this alternative could change sport fishing access to the Fish Creek-Susitna River drainage and the lower reaches of the Little Susitna River.

#### **G.3.5.2 Mac West-Connector 1-Houston-Houston North Alternative**

Construction of the Mac West-Connector 1-Houston-Houston North Alternative would involve nine crossings of streams that provide EFH (Tables G-5 and G-8). There is spawning and overwintering habitat at 2 of the EFH crossings. All streams this alternative would cross provide rearing habitat and passage for salmon during seasonal migrations. ARRC would construct a bridge at the Little Susitna River crossing (HN-3.2) and would use three drainage structures to cross EFH streams. The bridge over the Little Susitna River would require instream pilings within a reach with documented spawning habitat for three of five Pacific salmon (Table G-5). ARRC would use culverts to cross the remaining five EFH streams (Tables G-5 and G-8). Six EFH stream crossings along this alternative would be in areas where development has created potential unnatural blockages because of ineffective culverts or other crossing structures. This alternative would cross waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including Lake Creek and the Little Susitna River, and many unnamed tributaries to these waters. Development of this alternative could change access to the Little Susitna River and Lake Creek in the Little Susitna State Recreation River near Parks Highway.

#### **G.3.5.3 Mac West-Connector 1-Houston-Houston South Alternative**

Construction of the Mac West-Connector 1-Houston-Houston South Alternative would involve crossing six streams that provide EFH (Tables G-5 and G-8). There is spawning habitat at 2, and overwintering habitats at 4 of these stream crossings. ARRC would construct a bridge at the Little Susitna River crossing (MP-174.3) next to an existing bridge. The bridge over the Little Susitna River would require instream pilings within a reach with documented spawning habitat for three of five Pacific salmon (Table G-5). ARRC would use two drainage structures to cross EFH streams, and would use culverts to cross the remaining three EFH streams (Tables G-5 and G-8). All streams that this alternative would cross provide rearing habitat and passage for salmon during seasonal migrations. Half of the stream crossings along this alternative are in areas where development has created potential unnatural blockages because of ineffective culverts. This alternative would cross waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including the Little Susitna River and several unnamed Little Susitna tributaries.

#### **G.3.5.4 Mac West-Connector 2-Big Lake Alternative**

Construction of the Mac West-Connector 2-Big Lake Alternative would involve crossing eight EFH streams (Tables G-5 and G-8). There is spawning habitat at two stream crossings and habitats appear suitable for overwintering at four stream crossings. All streams that this alternative would cross provide rearing habitat and passage for salmon during seasonal migrations. ARRC would not construct bridges along this alternative. ARRC would use six drainage structures to cross EFH streams. ARRC would use a culvert at one of the EFH streams and would relocate two sections totaling 2,440 feet of an EFH stream channel into 2,460 feet of new channel (Table G-5 and G-8). All EFH streams that this alternative would cross are in areas where development has created potential unnatural blockages because of ineffective culverts (Table G-5). This alternative would cross waters important for sustaining recreational and commercial salmon fisheries in the Big Lake and Goose Creek drainages in Southcentral Alaska, including Little Meadow Creek, Lucile Creek, Fish Creek, and Goose Creek. The crossing of Goose Creek would be within a large unique fen system that would likely be drained or filled to provide an area for construction, which would result in the loss of about 4 acres within the 200-foot ROW and likely extend outward within the 19-acre high-value wetland and juvenile rearing habitat.

#### **G.3.5.5 Mac East-Connector 3-Willow Alternative**

Construction of the Mac East-Connector 3-Willow Alternative would involve crossing six streams that provide EFH. There is spawning habitat at four of these stream crossings. All streams that this alternative would cross provide rearing habitat and passage for salmon during seasonal migration (Tables G-5 and G-8). ARRC would construct bridges at four of the six EFH stream crossings, and would construct a drainage structure and a culvert at the remaining two crossings (Figure G-3; Tables G-5 and G-8). Two of the four bridges would require instream pilings within reaches of the Little Susitna River and Willow Creek with documented spawning habitat for four of five Pacific salmon (Table G-5). One of the stream crossings along this alternative appears to have a potential unnatural blockage from ineffective culverts. One stream has potential beaver dam blockages (Table G-8). This alternative would cross four waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including Rodgers Creek, Willow Creek, Fish Creek (Susitna River tributary), and the Little Susitna River. Development of this alternative could change sport fishing access to the Fish Creek-Susitna River drainage and the lower reaches of the Little Susitna River.

#### **G.3.5.6 Mac East-Connector 3-Houston-Houston North Alternative**

Construction of the Mac East-Connector 3-Houston-Houston North Alternative would involve crossing eight streams that provide EFH (Tables G-5 and G-8). There is spawning and overwintering habitat at 1 of these stream crossings. All EFH streams that this alternative would cross provide rearing habitat and passage for salmon during seasonal migrations. ARRC would construct a bridge at the Little Susitna River crossing (HN-3.2), and would use three drainage structures to cross EFH streams (Figure G-3). The bridge over the Little Susitna River would require instream pilings within a reach with documented spawning habitat for three of five Pacific salmon (Table G-5). ARRC would use culverts to cross the remaining four EFH streams (Tables G-5 and G-8). Most stream crossings along this alternative (75 percent) would be in

areas where development has created potential unnatural blockages because of ineffective culverts (Table G-8). This alternative would cross waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including Lake Creek and the Little Susitna River, and many unnamed tributaries to these waters. Development of this alternative could change access to the Little Susitna River and Lake Creek in the Little Susitna State Recreation River near Parks Highway.

#### **G.3.5.7 Mac East-Connector 3-Houston-Houston South Alternative**

Construction of the Mac East-Connector 3-Houston-Houston South Alternative would involve crossing five streams that provide EFH (Tables G-5 and G-8). There is spawning and overwintering habitat at 2 of the stream crossings. All streams that this alternative would cross provide rearing habitat and passage for salmon during seasonal migrations. ARRC would construct a bridge at the Little Susitna River crossing (MP-174.3) next to an existing bridge. The bridge over the Little Susitna River would require instream pilings within a reach with documented spawning habitat for three of five Pacific salmon (Table G-5). ARRC would use two drainage structures to cross EFH streams. ARRC would use culverts to cross the remaining two EFH streams (Figure G-3; Tables G-5 and G-8). Three of the stream crossings along this alternative are in areas where development has created potential unnatural blockages because of ineffective culverts (Table G-8). This alternative would cross waters important for sustaining recreational and commercial salmon fisheries in Southcentral Alaska, including the Little Susitna River and several unnamed Little Susitna tributaries.

#### **G.3.5.8 Mac East-Big Lake**

Construction of the Mac East-Big Lake Alternative would involve crossing eight streams that provide EFH (Tables G-5 and G-8). There is spawning habitat at 2 of the stream crossings, and habitats appear suitable for overwintering at 4 of stream crossings. All streams that this alternative would cross provide rearing habitat and passage for salmon during seasonal migrations. ARRC would not construct bridges along this alternative. ARRC would use six drainage structures to cross EFH streams (Figure G-3). ARRC would use a culvert to cross one of the EFH streams and would block a section of an EFH stream with fill which would be relocated to a new channel and crossed by a box culvert. All streams that this alternative would cross are in areas where development has created potential unnatural blockages because of ineffective culverts (Table G-8). This alternative would cross waters important for sustaining recreational and commercial salmon fisheries in the Big Lake and Goose Creek drainages in Southcentral Alaska, including Little Meadow Creek, Lucile Creek, Fish Creek, and Goose Creek. The crossing of Goose Creek would be within a large unique fen system that would likely be drained or filled to provide an area for construction, resulting in the loss of about 4 acres within the 200-foot ROW and likely extending outward within the 19-acre high-value wetland and juvenile rearing habitat.

### **G.3.6 No-Action Alternative**

Under the No-Action Alternative, no EFH stream crossings would be constructed and no additional impacts to EFH would result. Existing stream crossing structures, recreational fishing, commercial fishing, recreational boating, and off-road vehicle activities would continue to



impact EFH and salmon fisheries resources in the study area. Absent the proposed rail line, there could be other, non-project-related impacts to EFH. The area could experience increased development of privately held and some state land the Applicant would otherwise have purchased for rail line construction and operations. There could also be increased road construction and maintenance in the area to support materials transported by heavy trucks. Depending on the extent to which these potential alternative development activities would require stream crossings and would result in increased erosion and sedimentation, there could be impacts to EFH.

## **G.4 Mitigation**

This section identifies mitigation measures that would avoid, minimize, or compensate for potential adverse impacts to EFH. Federal, State of Alaska, and local regulations and permit processes are in place to ensure that construction and operations activities are conducted in an environmentally responsible manner and that the Applicant would be required to comply with the resulting reasonable requirements and associated best management practices.

This section describes mitigation measures proposed by the Applicant, some of which are regulatory-related requirements and associated best management practices developed by SEA based on the information available to date, and consultations with appropriate agencies.

### **G.4.1 Applicant's Voluntary Mitigation Measures**

Voluntary mitigation measures proposed by the Applicant have been incorporated into the initial design of the proposed project in order to reduce the potential for adverse effects to EFH streams. The Applicant's voluntary measures for avoidance, minimization or mitigation of potential impacts include:

- For all project-related crossings of fish-bearing waters that incorporate bridges or culverts, the Applicant shall design, construct, and maintain the conveyance structures in accordance with the National Marine Fisheries Service 2008 publication, "Anadromous Salmonid Passage Facility Design" [National Marine Fisheries Service. 2008. Anadromous Salmonid Passage Facility Design. National Marine Fisheries Service, Northwest Region, Portland, Oregon] or equivalent and reasonable requirements.
- The Applicant shall time project-related construction in anadromous streams to minimize adverse effects to salmon during critical life stages when practicable. The Applicant shall incorporate timing windows [i.e., those time periods when salmon are least vulnerable to disturbances], as specified by the Alaska Department of Fish and Game Division of Habitat, into construction contract specifications for instream work. The Applicant shall design and construct stream crossings so as not to impede fish passage or impair the hydrologic functioning of the waterbody.
- The Applicant shall implement Essential Fish Habitat (EFH) conservation measures as agreed upon with the National Marine Fisheries Service during the EFH consultation process for this project.

- The Applicant shall obtain Federal permits required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, from the U.S. Army Corps of Engineers prior to initiation of project-related construction activities in wetlands and waterbodies. The Applicant also agrees to obtain necessary state permits and authorizations (e.g., Alaska Department of Fish and Game Fish Habitat Permit, Alaska Department of Natural Resources Land Use Permit, and an Alaska Department of Environmental Conservation Section 401 water quality certification). The Applicant shall incorporate stipulations into construction contract specifications.
- The Applicant shall be subject to U.S. Environmental Protection Agency and Alaska Department of Environmental Conservation jurisdiction under the National Pollutant Discharge Elimination System (NPDES) for stormwater discharges resulting from project-related construction activities. Requirements that are commonly part of a Stormwater Pollution Prevention Plan associated with a NPDES Stormwater Construction Permit include the following:
  - Ground disturbance shall be limited to only the areas necessary for project-related construction activities.
  - During earthmoving activities, topsoil shall be reused wherever practicable and stockpiled for later application during reclamation of disturbed areas.
  - Appropriate erosion control measures shall be employed to minimize the potential for erosion of soil stockpiles until they are removed and the area is restored.
  - Disturbed areas shall be restored as soon as practicable after construction ends along a particular stretch of rail line, and the goal of restoration shall be the rapid and permanent reestablishment of native ground cover on disturbed areas to prevent soil erosion.
  - The bottom and sides of drainage ditches shall be revegetated using natural recruitment from the native seed sources in the stockpiled topsoil or a seed mix free of invasive plant species.
  - If weather or season precludes the prompt reestablishment of vegetation, temporary erosion control measures shall be implemented.
- The Applicant shall avoid and minimize impacts to waters of the United States, including wetlands, to the extent practicable. The Applicant shall provide compensatory mitigation for unavoidable impacts to wetlands as part of the U.S. Army Corps of Engineers Section 404 permit, to the extent practicable in accordance with the reasonable requirements of the Clean Water Act.
- The Applicant shall minimize the number of temporary stream crossings constructed to provide access for contractors, work crews, and heavy equipment to the extent practicable. Where needed, temporary structures shall be placed to avoid overly constricting active channels and shall be removed as soon as practicable after the crossing is no longer needed.
- The Applicant shall disturb the smallest area practicable around any streams and, as soon as practicable following project-related construction activities, revegetate disturbed areas using native vegetation.

- When project-related construction activities, such as culvert and bridge construction, require work in streambeds, the Applicant shall conduct activities, to the extent practicable, during either summer or winter low-flow conditions.
- The Applicant shall design and construct the proposed rail line in such a way as to maintain natural water flow and drainage patterns to the extent practicable. This shall include installing bridges or placing equalization culverts through the embankment as necessary, preventing impoundment of water or excessive drainage, and maintaining the connectivity of floodplains and wetlands.

#### **G.4.2 SEA's Preliminary Mitigation Measures**

In addition to the Applicant's voluntary measures, SEA has developed preliminary measures to protect salmon freshwater habitats which include:

- Unless otherwise approved by the Alaska Department of Fish and Game, project-related detonation of explosives within, beneath, or in proximity to fish-bearing waters shall not result in overpressures exceeding 2.7 pounds per square inch unless the water body, including its substrate, was frozen solid. Peak particle velocity stemming from explosive detonation shall not exceed 0.5 inch per second during the early stages of egg incubation.
- The Applicant shall not narrow an anadromous water body between its mean high water lines for the project, unless authorized in writing by Alaska Department of Fish and Game (ADF&G) prior to project-related construction, thereby enabling ADF&G to apply reasonable design criteria or requirements.
- During project construction, the Applicant shall not clear riparian vegetation within 100 feet of fish-bearing water bodies and 50 feet of non-fish-bearing water bodies and emergent wetlands, unless approved by the Alaska Department of Natural Resources.
- The Applicant shall design, construct, and operate the rail line and associated facilities, including bridge abutments, to maintain existing water patterns and flow conditions and provide long-term hydrologic stability by conforming to natural stream gradients and stream channel alignment and avoiding altered subsurface flow, to the extent practicable. Project-related supporting structures (e.g., bridge piers) shall be designed to minimize scour and increased flow velocity, to the extent practicable.
- During project-related design, the Applicant shall align road and track crossings of water bodies perpendicular or near perpendicular to water bodies, where practicable, to minimize crossing length and potential bank disturbance.
- During project-related construction, the Applicant shall remove all project-related construction debris (including construction materials, soil, or woody debris) from water bodies, including wetlands, as soon as practicable during the open-water period, or prior to break-up for debris on top of or within ice or snow crossings.
- The Applicant shall follow all applicable Federal regulations and standard protocols for transporting hazardous substances and other deleterious compounds to minimize the potential for a spill occurrence.

- The Applicant shall ensure that all project-related culverts and bridges are sufficiently clear of debris to avoid stream-flow alteration and increased flooding. The Applicant shall inspect all drainages, bridges, and culverts semi-annually (or more frequently, as seasonal flows dictate) for debris accumulation and remove and properly dispose of debris promptly.
- The Applicant shall comply with the reasonable requirements of Alaska Statute (AS) 16.05.841, Fishway Required, and AS 16.05.871, Protection of Fish and Game, regarding project-related winter ice bridge crossings and summer ford crossings of all anadromous and resident fish streams. If necessary, natural ice thickness could be augmented (through removing snow, adding ice or water, or other technique) if site-specific conditions, including water depth, are sufficient to protect fish habitat and maintain fish passage.
- Prior to construction, the Applicant shall complete jurisdictional delineations of wetlands and other surface waters that are subject to Section 404 of the Clean Water Act for all associated facilities proposed outside of the right-of-way.
- Prior to initiating project-related construction activities, the Applicant shall mark stream channels and existing culvert locations in the project construction area before snowfall obscures their location to avoid damage to these areas.
- The Applicant shall construct project-related water crossings in a manner that minimizes disturbances to streambeds, streambanks, and flow. Measures to meet these goals could include installing bridge piers during the winter, and initially constructing permanent project-related crossing structures, when practicable, to avoid the need to construct both temporary and permanent crossing structures.
- Prior to construction, the Applicant shall consult with the Alaska Department of Environmental Conservation or other regulatory agencies to determine appropriate regulations and associated requirements for project-related tank storage facilities. At a minimum, the Applicant shall place tank storage facilities as far as practicable from streams or rivers, and implement secondary containment measures (e.g., use of lined and bermed pits).
- The Applicant shall direct the operators of project-related vehicles to not drive in or cross streams other than at crossing points determined by the Alaska Department of Environmental Conservation and U.S. Army Corps of Engineers.
- During final design of the project, the Applicant shall conduct all siting, design, and development of the rail line and associated facilities according to the reasonable requirements within the jurisdiction of the Alaska Department of Natural Resources and the Alaska Department of Fish and Game.
- The Applicant shall return all project-related stream crossing points to their preconstruction contours to the extent practicable.
- The Applicant shall implement all reasonable best management practices imposed by the U.S. Army Corps of Engineers' (USACE) Section 404 Permit under the Clean Water Act to minimize project-related impacts to waters of the U.S., including wetlands. Standard best management practices are specified in the USACE Alaska District's Nationwide Permits General Best Management Practice Guide (U.S. Army Corps of Engineers, 2007. "Nationwide Permits: General Best Management Practices." Alaska District, Regulatory

Program. Online at: <http://www.poa.usace.army.mil/reg/NWPs.htm>) and could include the following:

- Containing sediment and turbidity at the work site by installing diversion or containment structures.
- Disposing of dredge spoils or unusable excavated material not used as backfill at upland disposal sites in a manner that minimizes impacts to wetlands.
- Revegetating wetlands as soon as possible, preferably in the same growing season, by systematically removing vegetation, storing it in a manner to retain viability, and replacing it after construction to restore the site.
- Using fill materials that are free from fine material.
- Stockpiling topsoil and organic surface material, such as root mats, separately from overburden and shall return it to the surface of the restored site.
- Dispersing the load of heavy equipment such that the bearing strength of the soil (the maximum load the soil can sustain) would not be exceeded. Suitable methods could include, but are not limited to, working in frozen or dry ground conditions, employing mats when working in wetlands or mudflats, and using tracked rather than wheeled vehicles.
- Using techniques such as brush layering, brush matting, live siltation (a revegetation technique used to trap sediment), jute matting and coir logs to stabilize soil and reestablish native vegetation.

## G.5 Summary of Impacts to EFH

The primary impacts to EFH from construction and operation of the proposed Port MacKenzie Rail Extension would be loss and degradation of instream and riparian habitats due to placement of bridges, culverts, and drainage structures; alteration of stream and wetland hydrology; blockage of fish movements; and increased erosion and sedimentation from the removal of riparian vegetation. All crossings of EFH-bearing streams would result in some loss or alteration of stream and riparian habitats. Bridged crossings would likely result in a smaller area of instream habitat loss compared to culverts. In general, clear-span bridges (those without stream supports) would have less potential to create conditions that would cause loss of spawning habitats, blockage of fish movements, alteration of stream hydrology, and increased erosion and sedimentation.

Table G-8 summarizes impacts to EFH-bearing streams for each alternative. The proposed alternatives would cross between five and nine streams containing EFH. All EFH-bearing streams crossed by the alternatives provide rearing habitat and passage of salmon during seasonal movements. There are habitats suitable for salmon spawning at 9 of the 25 EFH-bearing streams and overwintering habitats at 11 of the 25 EFH-bearing stream crossings, depending on alternative (Table G-8). The proposed alternatives would include between zero and four bridges, one to five culverts, one to six drainage structures, and zero to one stream relocation. Proposed alternative include between one and eight crossing locations on streams with potential blockage from previous crossings that could include ineffective culverts.

All alternatives would cross waters important for sustaining recreational and commercial salmon fisheries, with the greatest number of important waters crossed by alternatives containing the Willow Segment and the fewest important waters crossed by alternatives containing the Houston-Houston South Segment. Of the three potential crossing locations on the Little Susitna River, the Houston-Houston South crossing (MP-174.3) and the Houston-Houston North segments would affect spawning habitat for three salmon species, while the Willow Segment crossing (W-0.6) would affect spawning habitat for four salmon species. The Houston-Houston South crossing of the Little Susitna River is also within a reach that is about half the wetted width of the crossings on the Houston-Houston North and Willow segment crossings. Alternatives that include the Willow Segment could alter sport fishing access to the Fish Creek-Susitna River drainage and the lower reaches of the Little Susitna River; alternatives that include the Houston-Houston North Segment could change access to the Little Susitna River and Lake Creek within the Little Susitna State Recreation River near Parks Highway. Alternatives that have a potential to increase sport harvest of federally managed salmon fisheries could result in reduced recruitment leading to reduced stocks prompting changes in Federal management. Alternatives that include the Big Lake Segment would cross Goose Creek, a large unique fen system that would likely have to be drained or filled to provide an area for construction, resulting in the loss of about 4 acres within the 200-foot ROW.

## G.6 References

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## **APPENDIX H**

### **BIOLOGICAL ASSESSMENT**

## H. BIOLOGICAL ASSESSMENT

### H.1 Executive Summary

This Biological Assessment addresses potential effects of the Alaska Railroad Corporation's (ARRC or Applicant) proposed Port MacKenzie Rail Extension (the proposed project) on federally listed threatened and endangered species that are protected under the Endangered Species Act. After consulting the U.S. Fish and Wildlife Service and the National Marine Fisheries Service on potential threatened or endangered species that could be affected by the proposed project, the Surface Transportation Board (STB or the Board) Section of Environmental Analysis (SEA) determined that the proposed project could indirectly affect the endangered Cook Inlet beluga whale (*Delphinapterus leucas*). SEA identified and evaluated potential indirect effects on beluga whale that include: 1) beluga whale forage fish at freshwater stream crossings that support anadromous salmon and smelt throughout the proposed project area, and 2) induced noise and disturbance effects in the immediate vicinity of Port MacKenzie at the entrance of the Knik Arm, as a result of induced increases in vessel traffic to and from Port MacKenzie. SEA, in consultation with National Marine Fisheries Service, did not identify any direct impacts from the proposed project to the beluga whale or beluga whale habitats in the waters of Cook Inlet or within the lower reaches of the Susitna River or the Little Susitna River.

Depending on the alternative that could be chosen, the proposed 35- to 40-mile line rail extension would cross between 5 and 9 streams supporting anadromous salmon populations in the Willow Creek and Fish Creek-Susitna River drainages; the Little Susitna River drainage; Lucille Creek, Fish Creek, and Goose Creek-Knik Arm drainages; and several other small Cook Inlet drainages. These crossings could potentially result in habitat loss or reduced habitat quality for salmon populations, which are important forage resources for the Cook Inlet beluga whale. Implementation of avoidance, minimization, and mitigation measures at these anadromous crossings would likely eliminate or reduce any potentially significant effects to the anadromous fish stream habitats crossed by proposed project alternatives, such that changes in anadromous fish runs supporting beluga whales would not be expected to occur as a result of the proposed project.

Operation of the proposed rail line extension, including delivery of bulk materials and freight to and from Port MacKenzie, would potentially increase vessel traffic at Port MacKenzie from an average of 50 ships per year during 2005 to 2008, the vast majority of which were associated with barge traffic between Port MacKenzie and the Port of Anchorage, to as many as 55 to 63 ships per year if rail line operation would occur while Port of Anchorage expansion continues, potentially displacing beluga whales from the Port MacKenzie area due to noise and disturbance (see Section H.5). As many as 60 percent of beluga whales may seasonally use the Knik Arm, after passing through the Knik Arm Narrows and between the Port of Anchorage and Port MacKenzie. This area has experienced ongoing increases in industrial, shipping, and aircraft noise and disturbance, but continues to be used by beluga whales. Ships coming into Port MacKenzie would generally be moving slowly and injury to beluga whales from strikes by ships calling at Port MacKenzie would be highly unlikely. Ships used to transport materials delivered to and from Port MacKenzie by the rail extension would not produce noise in excess of the 180 dB re: 1  $\mu$ Pa, which is defined as Level A harassment for marine mammals. In addition, sound

from ship traffic is concentrated at low frequencies (less than 0.5 kHz for container ships and freighters) that are outside the range of beluga whale hearing and vocal communications, and sound pressure levels would attenuate within short distances from the source to levels well below the Level B harassment threshold.

SEA has determined that the Port MacKenzie Rail Extension, if authorized, ***may affect, but is not likely to adversely affect*** the Cook Inlet beluga whale or access of beluga whales to Type 1 habitats (intensive use from spring through fall for foraging and nursing) in the Knik Arm.

## **H.2 Project Location and Description**

The proposed Port MacKenzie Rail Extension would be within the Matanuska-Susitna Borough, northwest of Anchorage, on the west side of the Knik Arm (Figure H-1). The proposed project is generally bounded by the Susitna River on the west, Knik Arm of Cook Inlet on the south and east, and Parks Highway and existing Alaska Railroad Corporation main line to the north.

The proposed Port MacKenzie Rail Extension would involve the construction and operation of a proposed rail line connecting the Matanuska-Susitna Borough's Port MacKenzie, in Southcentral Alaska, to a point on the ARRC's existing main line between Wasilla and north of Willow, Alaska (Figure H-1). With the STB as the lead agency, eight alternatives and the No-Action Alternative are being evaluated for an environmental impact statement (EIS) of the proposed project. The alternatives are composed of southern and northern segments, with possible connector segments in between. The southern segments—Mac West and Mac East—would run either east or west of the Point MacKenzie Agricultural Project. The three main northern sections, north of the Point MacKenzie Agricultural Project, are Willow, Houston, and Big Lake, with Houston having a north or south variant. Connector segments link the north and south segments to create eight possible routes for the proposed rail line.

According to the Applicant, the proposed rail line would provide freight services between Port MacKenzie and Interior Alaska and would support Port MacKenzie's continuing development as an intermodal and bulk material resources export and import facility. Major elements of the proposed rail extension would include between 30 and 45 miles of proposed railroad track within a 200-foot-wide right-of-way; crossings of local roads, streams, trails, and utility corridors; sidings; and associated facilities. The proposed project potentially crosses Willow Creek and Fish Creek -Susitna River drainages; the Little Susitna River drainage; Lucille Creek, Fish Creek, and Goose Creek-Knik Arm drainages; and several other small Cook Inlet drainages.

Rail bridges and culverts would be required for crossing anadromous fish-bearing waterbodies important to beluga whales. The current location, type, and size of all proposed bridges and culverts are considered approximate and preliminary, and the exact locations, types, and sizes would be determined during the final design and permitting process. Some crossings are currently identified as 'drainage structures,' which are crossing structures that would be determined by the Applicant during the final design process and could include culverts, pre-cast arches, and single or multiple short-span bridges. The Applicant has stated that all bridges and culverts would be designed to allow fish passage in accordance with an ADNR Title 41 fish habitat permit.

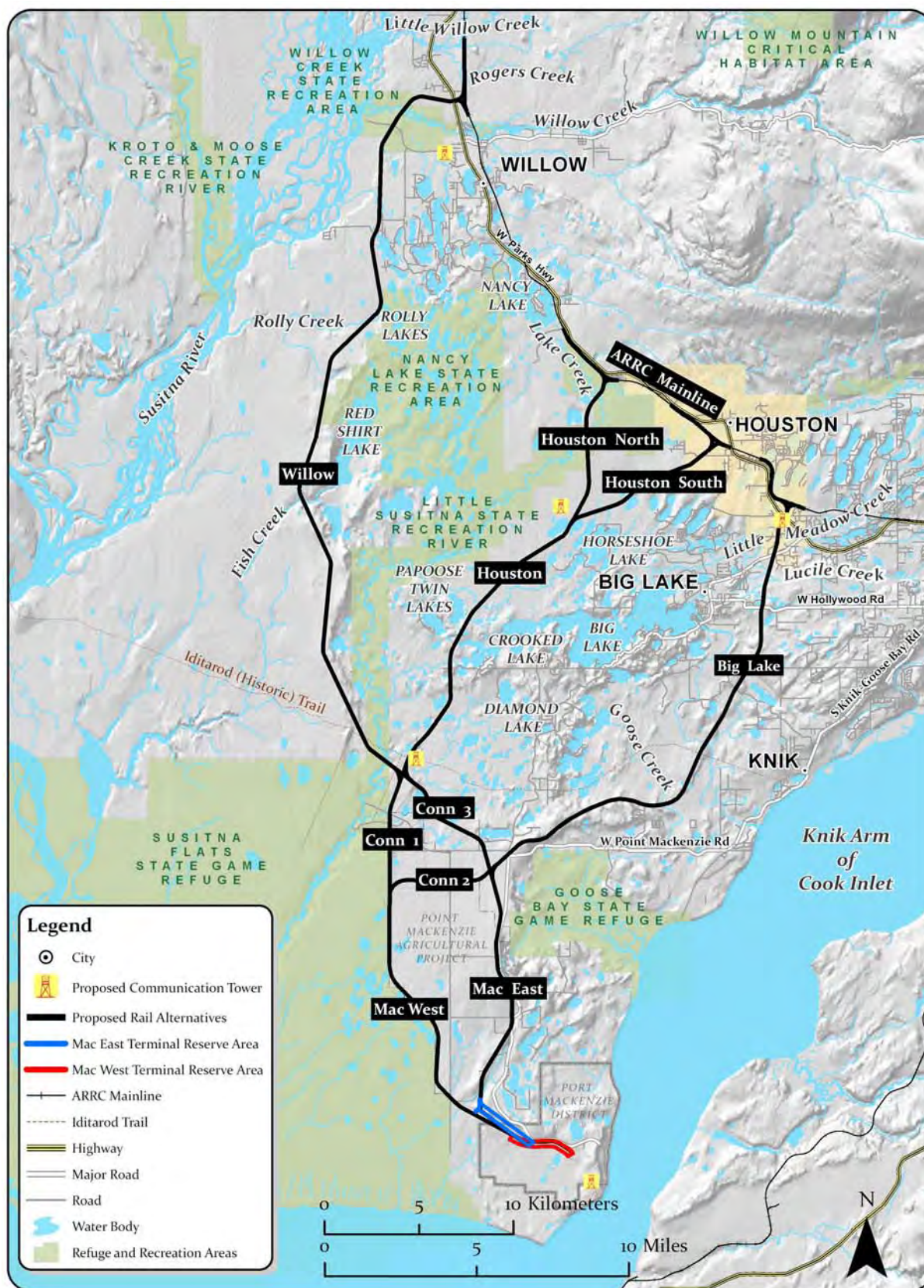


Figure H-1. Proposed Port MacKenzie Rail Extension

A terminal reserve area would be established for the Port MacKenzie Rail Extension, which would provide for freight off-loading and rail line and equipment maintenance. No marine habitat would be directly affected by the Port MacKenzie Rail Extension.

Ship traffic (e.g., Panamax class vessels) at Port MacKenzie would likely increase as a result of operation of the rail line extension. Based on ARRC's petition for exemption for licensure for the construction and operation of the rail line on December 5, 2008, ARRC anticipated a maximum average of approximately two freight trains per day (one in each direction) with an average of 40 to 80 freight cars each, which would equate to approximately 13 Panamax class ships per year. This train and ship count was based upon market opportunities at the time of filing and the supply-based infrastructure and equipment limitations.

Based on current market opportunities, ARRC now estimates ship traffic for export of bulk commodities from the Port MacKenzie Rail Terminal would include 5 Panamax class ships per year at approximately 4-week intervals for an estimated 350,000 tons of bulk commodities per year over an approximately 20 week period (average 70,000 tons/ship ARRC, 2009).

The Applicant has proposed the following voluntary measures for avoidance, minimization or mitigation of potential adverse effects to anadromous fish streams that produce forage fish for the beluga whale.

- For all project-related crossings of fish-bearing waters that incorporate bridges or culverts, the Applicant shall design, construct, and maintain the conveyance structures in accordance with the National Marine Fisheries Service 2008 publication, "Anadromous Salmonid Passage Facility Design" (National Marine Fisheries Service. 2008. Anadromous Salmonid Passage Facility Design. National Marine Fisheries Service, Northwest Region, Portland, Oregon] or equivalent and reasonable requirements.
- The Applicant shall time project-related construction in anadromous streams to minimize adverse effects to salmon during critical life stages when practicable. The Applicant shall incorporate timing windows [i.e., those time periods when salmon are least vulnerable to disturbances], as specified by the Alaska Department of Fish and Game Division of Habitat, into construction contract specifications for instream work. The Applicant shall design and construct stream crossings so as not to impede fish passage or impair the hydrologic functioning of the waterbody.
- The Applicant shall implement Essential Fish Habitat (EFH) conservation measures as agreed upon with the National Marine Fisheries Service during the EFH consultation process for this project.
- The Applicant shall obtain Federal permits required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, from the U.S. Army Corps of Engineers prior to initiation of project-related construction activities in wetlands and waterbodies. The Applicant also agrees to obtain necessary state permits and authorizations (e.g., Alaska Department of Fish and Game Fish Habitat Permit, Alaska Department of Natural Resources Land Use Permit, and an Alaska Department of Environmental Conservation Section 401 water quality certification). The Applicant shall incorporate stipulations into construction contract specifications.



- The Applicant shall be subject to U.S. Environmental Protection Agency and Alaska Department of Environmental Conservation jurisdiction under the National Pollutant Discharge Elimination System (NPDES) for stormwater discharges resulting from project-related construction activities. Requirements that are commonly part of a Stormwater Pollution Prevention Plan associated with a NPDES Stormwater Construction Permit include the following:
  - Ground disturbance shall be limited to only the areas necessary for project-related construction activities.
  - During earthmoving activities, topsoil shall be reused wherever practicable and stockpiled for later application during reclamation of disturbed areas.
  - Appropriate erosion control measures shall be employed to minimize the potential for erosion of soil stockpiles until they are removed and the area is restored.
  - Disturbed areas shall be restored as soon as practicable after construction ends along a particular stretch of rail line, and the goal of restoration shall be the rapid and permanent reestablishment of native ground cover on disturbed areas to prevent soil erosion.
  - The bottom and sides of drainage ditches shall be revegetated using natural recruitment from the native seed sources in the stockpiled topsoil or a seed mix free of invasive plant species.
  - If weather or season precludes the prompt reestablishment of vegetation, temporary erosion control measures shall be implemented.
- The Applicant shall avoid and minimize impacts to waters of the United States, including wetlands, to the extent practicable. The Applicant shall provide compensatory mitigation for unavoidable impacts to wetlands as part of the U.S. Army Corps of Engineers Section 404 permit, to the extent practicable in accordance with the reasonable requirements of the Clean Water Act.
- The Applicant shall minimize the number of temporary stream crossings constructed to provide access for contractors, work crews, and heavy equipment to the extent practicable. Where needed, temporary structures shall be placed to avoid overly constricting active channels and shall be removed as soon as practicable after the crossing is no longer needed.
- The Applicant shall disturb the smallest area practicable around any streams and, as soon as practicable following project-related construction activities, revegetate disturbed areas using native vegetation.
- When project-related construction activities, such as culvert and bridge construction, require work in streambeds, the Applicant shall conduct activities, to the extent practicable, during either summer or winter low-flow conditions.
- The Applicant shall design and construct the proposed rail line in such a way as to maintain natural water flow and drainage patterns to the extent practicable. This shall include installing bridges or placing equalization culverts through the embankment as necessary, preventing impoundment of water or excessive drainage, and maintaining the connectivity of floodplains and wetlands.

## **H.3 Action Area**

The action area is defined as all areas to be affected directly or indirectly by the proposed action and not merely the area immediately adjacent to the action. SEA, in consultation with National Marine Fisheries Service, determined that the project could indirectly affect beluga whales, and identified areas where these indirect effects could occur. The areas include: 1) stream crossings that support anadromous salmon and smelt, and 2) the immediate vicinity of Port MacKenzie at the entrance of the Knik Arm that would experience an increase in vessel traffic to Port MacKenzie (Figure H-2). These areas define the action area for the project. Stream crossing action areas account for any potential adverse effects to anadromous fish, and the Port MacKenzie action area accounts for disturbance effects to beluga whales that could result from increased vessel traffic.

## **H.4 Species Occurrence**

The species addressed in this Biological Assessment were identified based on consultations with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service and the following correspondence:

- During initial consultations with the U.S. Fish and Wildlife Service, and scoping comments dated October 19, 2007, no listed species were identified as a concern. In a letter from SEA to the U.S. Fish and Wildlife Service, dated February 4, 2009, SEA requested information regarding the presence of threatened and endangered species and designated critical habitat in the proposed project area (see Appendix A, Agency Consultation). SEA noted that a review of the Endangered Species Act Consultation Guide Map for Alaska and project-related biological data indicated that no listed species or designated critical habitats are found in the proposed project area. SEA requested that the U.S. Fish and Wildlife Service confirm the lack of listed species and critical habitat within the action area for SEA's Section 7 consultation. The U.S. Fish and Wildlife Service responded on March 9, 2009 confirming that there are no federally listed or proposed species, and/or designated or proposed critical habitat within the action area of the project, and that the requirements of Section 7 of the Endangered Species Act have been satisfied for species under their jurisdiction.
- In a letter to SEA dated March 4, 2009, the National Marine Fisheries Service responded to a request for Endangered Species Act-listed threatened and endangered species that could be affected by the proposed project (Appendix A, Agency Consultation). The species identified were the Cook Inlet beluga whale and several Endangered Species Act-listed stocks of Pacific salmon from the Pacific Northwest that could occur in Alaskan waters. However, the National Marine Fisheries Service indicated that these salmon species are typically found in the North Pacific, south of the Bering Sea, and that the specific occurrence of these species in the proposed project area is highly unlikely.

### **H.4.1 Cook Inlet Beluga Whale**

Beluga whales (*Delphinapterus leucas*) are small, white, toothed whales found in the Northern Hemisphere throughout arctic and subarctic waters, generally in shallow, coastal waters (National Marine Fisheries Service, 2008). The National Marine Fisheries Service designated



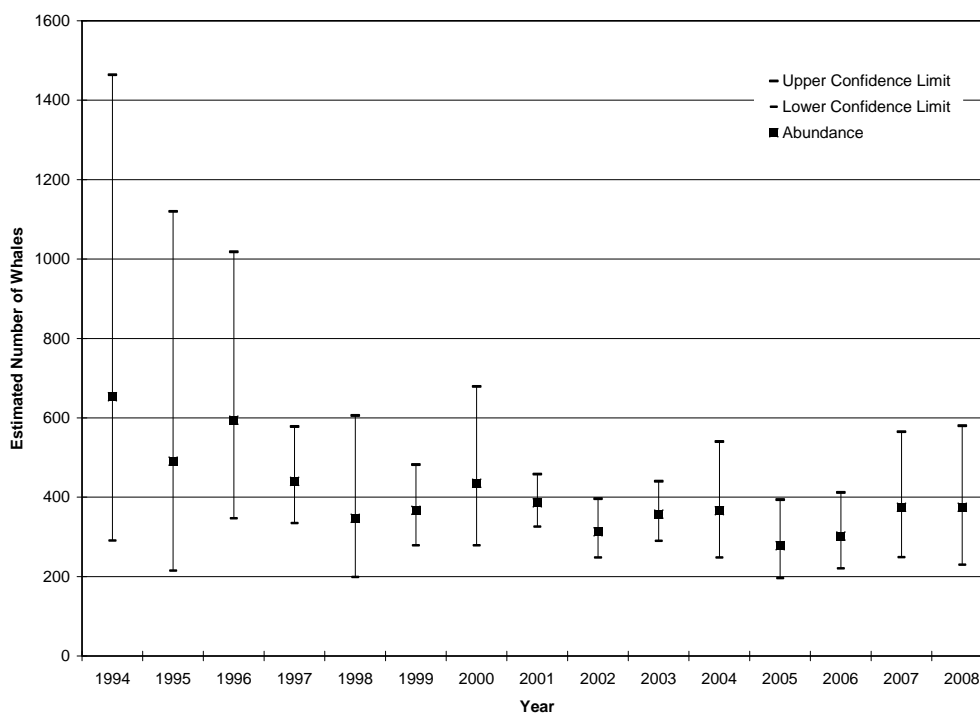


the Cook Inlet beluga whale stock as depleted under the Marine Mammal Protection Act on May 31, 2000 (65 FR 34590) and as endangered under the Endangered Species Act on October 22, 2008 (73 FR 62919). Belugas of Cook Inlet are a discrete isolated population that remains in Cook Inlet year round (Hobbs *et al.*, 2008; Hobbs & Shelden, 2008).

Cook Inlet belugas are concentrated in the upper Inlet, generally near river deltas and bays in the summer and fall, and they disperse offshore and move to mid-Inlet waters in the winter (National Marine Fisheries Service, 2008). Beluga whales average 12 to 14 feet long with females averaging smaller and lighter than the average 3,300 pound males. Female belugas attain sexual maturity between 8 and 9 years of age, and males mature slightly later. In Cook Inlet, breeding is believed to occur between late winter and early spring, with most calving occurring from mid-May to mid-June, although calving has been observed from April through August (National Marine Fisheries Service, 2008). The gestation period is about 14 to 14.5 months, and females may produce a calf about every 3 years (National Marine Fisheries Service, 2008). Belugas are believed to live to about 60 years of age (National Marine Fisheries Service, 2008).

Beluga whales consume a wide range of prey, probably influenced by both seasonal abundance and preference. Cook Inlet belugas focus on specific species when they are seasonally abundant (e.g., eulachon [*Thaleichthys pacificus*] and gadids [of the family *Gadidae*] were preferred prey in spring). From late spring and throughout the summer, belugas prey on Pacific salmon (*Onchorhynchus* spp.), coincident with the timing of spawning runs in the area. Five Pacific salmon species—Chinook (*O. tshawytscha*), pink (*O. gorbuscha*), coho (*O. kisutch*), sockeye (*O. nerka*), and chum (*O. keta*)—spawn in rivers throughout Cook Inlet. Overall, salmon were the prey species found most frequently in the stomachs of Cook Inlet belugas (Hobbs *et al.*, 2008). In the fall, as salmon runs begin to decline, belugas return to consuming fish found in nearshore bays and estuaries, including cod (*Gadus morhua*) and other bottom-dwelling fish, including Pacific staghorn sculpin (*Leptocottus armatus*), flatfishes, such as starry flounder (*Platichthys stellatus*), and yellowfin sole (*Limanda aspera*) (Hobbs *et al.*, 2008). Dive data from tagged belugas indicate that belugas feed in deeper waters in winter, possibly on flatfish, cod, sculpin, and pollock (*Theragra Chalcormma*) (Hobbs *et al.*, 2008).

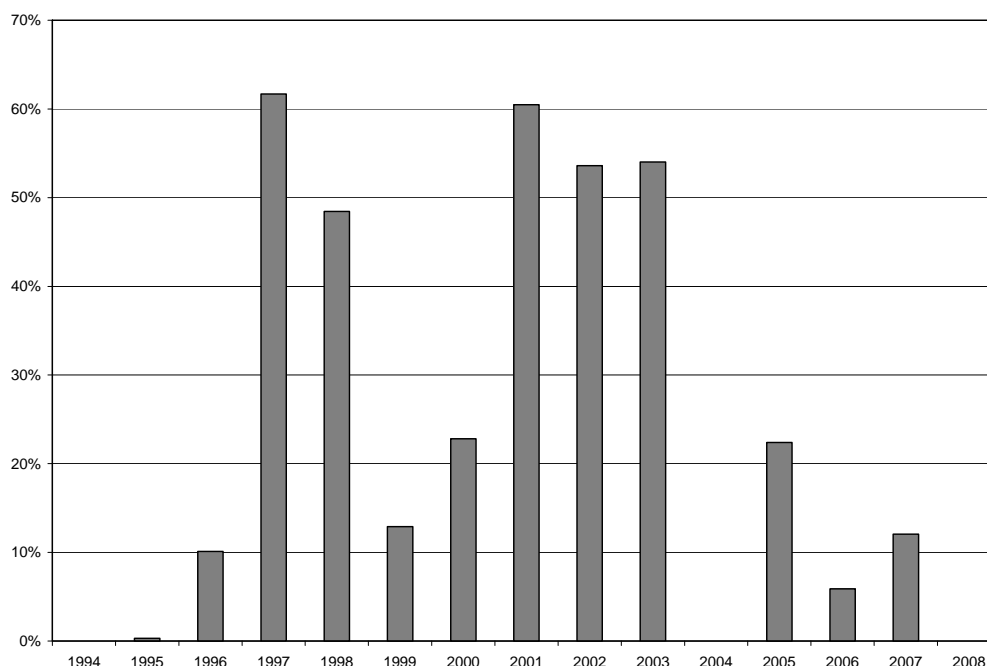
Abundance of belugas in Cook Inlet decreased from 1994 to 1998, most likely due to Native subsistence hunts (Figure H-3; Hobbs *et al.*, 2008). Estimating abundance of Cook Inlet belugas is difficult because of several sources of variability during aerial surveys, including variability in surfacing intervals of belugas, correction factors to account for missed whales, and observer ability. In addition, counting whales is difficult because of the high densities of beluga aggregations and the differential visibility of older, white belugas and younger, blue-gray belugas (Hobbs *et al.*, 2000). Population estimates for 1994 to 2008 showed an average annual rate of decline of 2.91 percent per year (Standard Error [SE] = 0.010) and an annual rate of decline of 15.1 percent (SE = 0.047) during the years 1994 to 1998 when the harvest was unrestricted. The National Marine Fisheries Service predicted that the beluga population would begin to recover at a rate of 2 to 6 percent per year after harvest was limited. Between 1999 and 2008, the rate of decline was 1.45 percent (SE = 0.014) per year. While this rate of decline is not significantly less than no growth, it is significantly less than the minimum predicted growth rate of 2 percent per year ( $P < 0.02$ ) (Hobbs & Shelden, 2008).



**Figure H-3. Estimated Abundance of Cook Inlet Beluga Whales from the National Marine Fisheries Service Annual Aerial Surveys 1994-2008, Showing Average Abundance and 95 Percent Confidence Intervals for Each Year (Hobbs *et al.*, 2008)**

Beluga proximity to Anchorage has increased significantly since the late 1970s. However, the summer distribution of Cook Inlet beluga whales has contracted since the late 1970s when belugas were distributed throughout Cook Inlet, with 10 percent of groups occurring south of the Kenai River and Kalgin Island. During 1993 to 2007, most beluga sightings were concentrated north and east of the Beluga River and Point Possession (Hobbs *et al.*, 2008). Belugas have remained in the area that previously had the highest impact from hunting (e.g., the north end of Cook Inlet, near Anchorage), and they have disappeared from peripheral habitats (e.g., the southern end of the inlet). It is not known if the current contracted distribution is a result of changing habitat, predator avoidance, or a shift of a reduced population into preferred habitat areas (Hobbs *et al.*, 2008). In winter, belugas are more dispersed throughout the Cook Inlet (Moore *et al.*, 2000). During the June and July abundance estimate surveys, the proportion of belugas using the Knik Arm has fluctuated between 0 to a little over 60 percent of the observed individuals (Figure H-4).

Cook Inlet has been stratified into three habitat regions characterized by beluga habitat use (Figure H-5) (National Marine Fisheries Service, 2008). Type 1 habitat is considered the most valuable due to its intensive use by belugas for foraging and nursery habitat from spring through fall, and because it is in the upper Inlet, where there is the greatest potential for anthropogenic impacts. Type 2 habitat includes areas with high fall and winter use, and a few isolated spring feeding areas, and Type 3 habitat includes the remaining portions of the range of belugas within Cook Inlet.



**Figure H-4. Proportion of Individual Beluga Whales Observed Within the Knik Arm During June and July Abundance Estimate Surveys of Cook Inlet Beluga Whales (Shelden *et al.*, 2008; Rugh *et al.*, 2007; Rugh *et al.*, 2006; Rugh *et al.*, 2005a; Rugh *et al.*, 2005b)**

## H.4.2 Critical Habitat

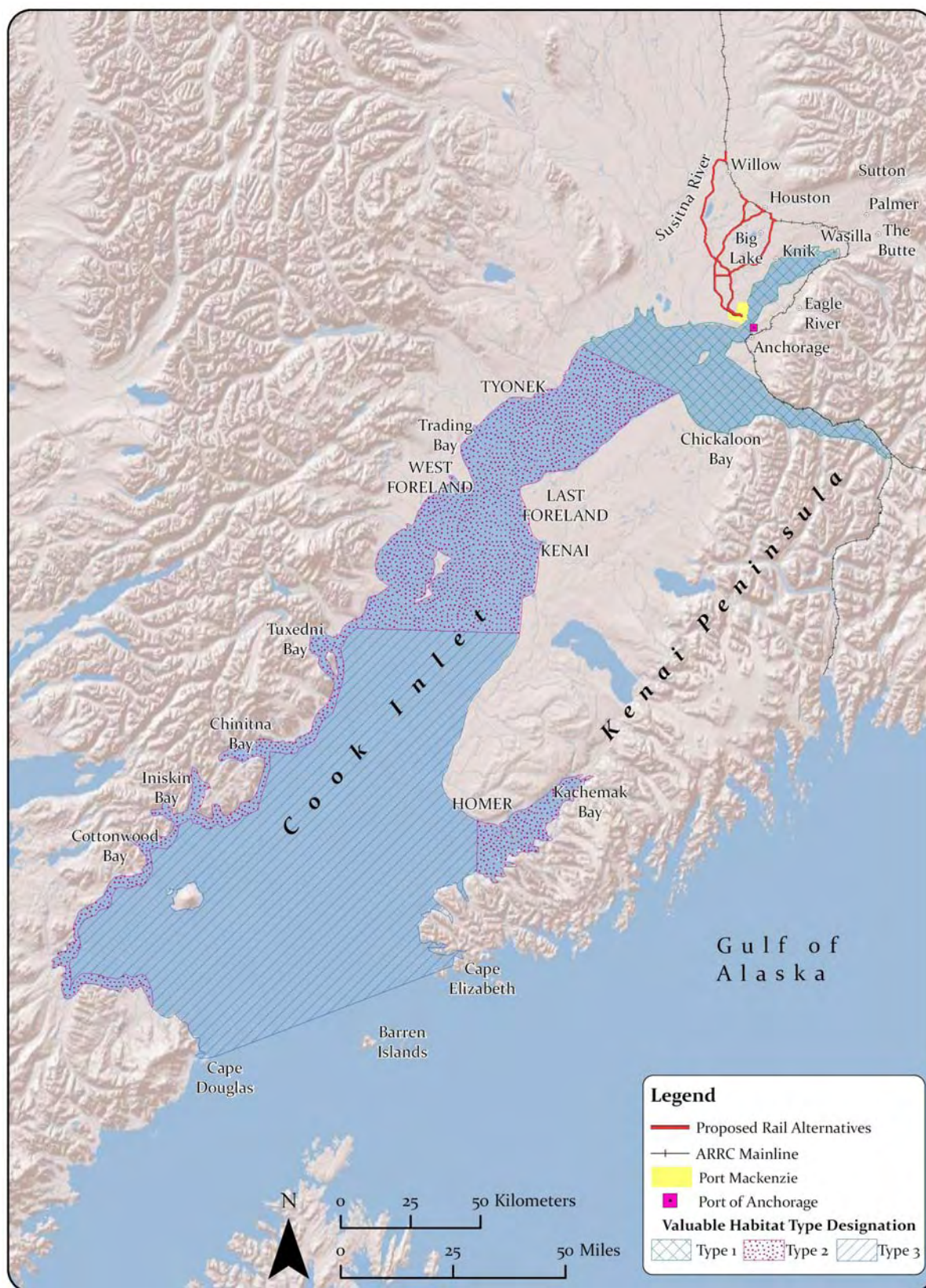
Critical Habitat for the Cook Inlet beluga whale has not been designated by the National Marine Fisheries Service, but is currently being evaluated. It may include Type 1 and/or Type 2 habitats or a combination of portions of all three valuable habitat types as described above and as illustrated in Figure H-5. If Critical Habitat is designated prior to construction and operation of the proposed project, SEA would reinitiate consultation with the National Marine Fisheries Service.

## H.5 Environmental Baseline

Beluga whales use Knik Arm as an important feeding area during much of the summer and fall, passing through the Knik Arm Narrows, past the Port of Anchorage and Port MacKenzie, to areas in the upper Knik Arm. Belugas ascend to upper Knik Arm on the flooding tide, feed on salmon returning to streams for spawning, and then fall back with the outgoing tide to waters off of and north of the Port of Anchorage and Port MacKenzie. The National Marine Fisheries Service has expressed concern for Cook Inlet belugas affected by developments that could restrict their passage along Knik Arm (National Marine Fisheries Service, 2008). Potential impacts that would be increased by aspects of Knik Arm development projects include:

- Encroachment into the lower Knik Arm from the west due to expansion of Port MacKenzie
- Increased dredging requirements with port expansions





**Figure H-5. Valuable Habitat Areas (Types 1, 2, 3) Identified for Cook Inlet Beluga Whales (National Marine Fisheries Service, 2008)**

- Increased ship traffic due to expansion of both ports in lower Knik Arms, new boat launches, and possible operation of a commercial ferry
- Increased in-water noise levels due to port construction, port operations, and the associated increased vessel traffic
- Increased need for vessel anchorage off both ports (National Marine Fisheries Service, 2008)

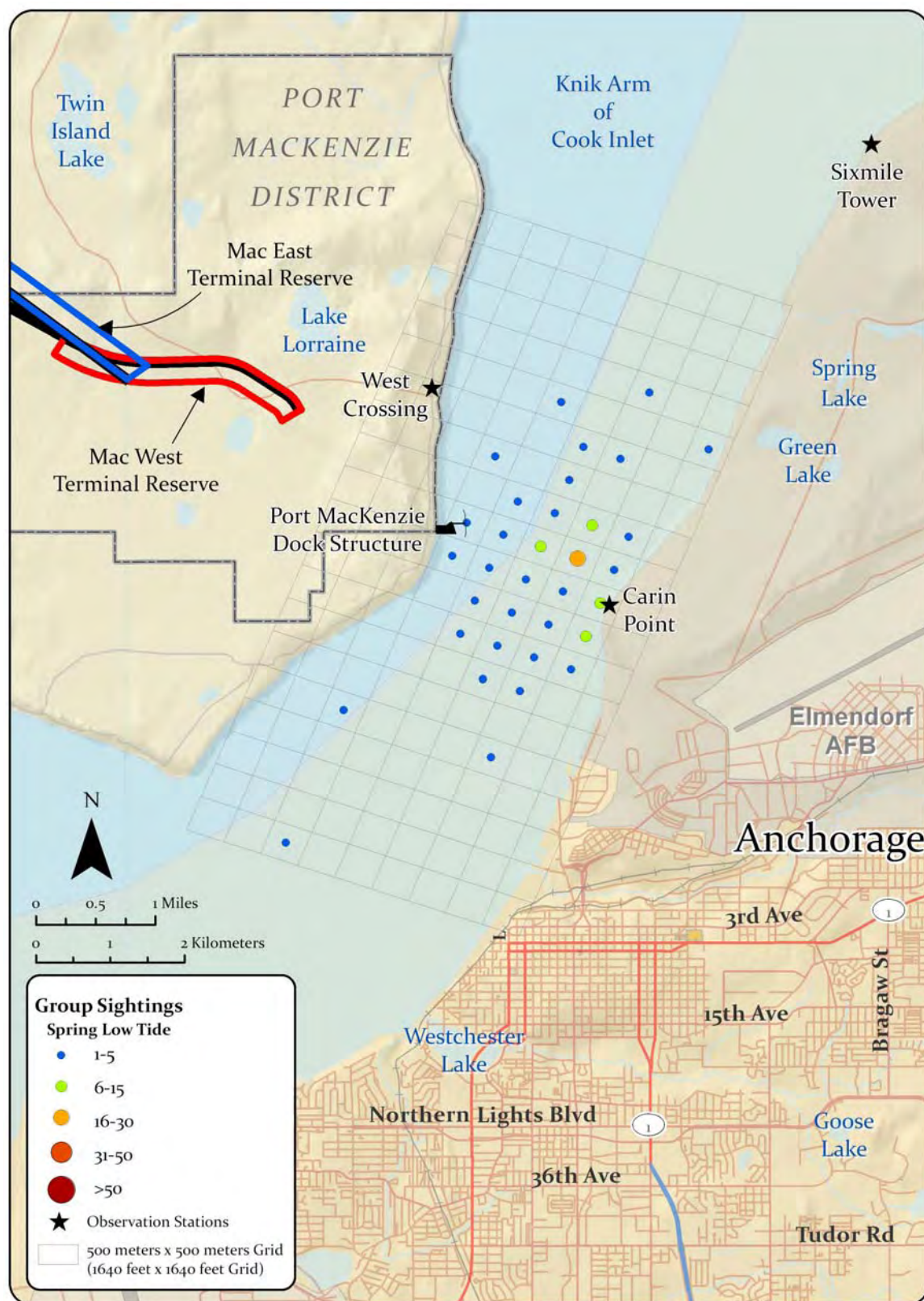
Port MacKenzie facilities include a deep draft dock that can be used on a year-round basis. In winter months with heavy ice, additional tie-down lines and a stand-by barge are used when ships are broken from their moorings by ice movements. In order to move with the flow of ice in winter, vessels schedule their arrivals on flood tides and departures on ebb tides. Vessel traffic was irregular at Port MacKenzie from 2005 through 2008, ranging from no ships to 187 vessels per year, with 185 of the vessels during 2008 associated with August gravel transportation for development at the Port of Anchorage (Van Dongen, 2009b). Construction at the Port of Anchorage is slated to continue through 2014. Because this work could overlap with operation of the proposed rail line, these 185 vessels were included in the calculation of average annual traffic at Port MacKenzie.

The current beluga whale use of the area around Port MacKenzie reflects the past and present effects of human activities at the Port and is the baseline condition used for the effects analysis that follows. The existing noise and disturbance levels near Port MacKenzie are described from studies completed for the Knik Arm Crossing, the Port MacKenzie Expansion, and the Port of Anchorage Expansion (Prevel Ramos *et al.*, 2006; Funk *et al.*, 2005; Blackwell, 2005; Blackwell & Greene, 2002). In general, beluga whales use the Knik Arm primarily between August and November, riding up the Knik Arm on the flood tide and down the Kink Arm on the ebb tide (Funk *et al.*, 2005). Belugas generally use the area near Port MacKenzie more frequently during lower tides and late in the day (Funk *et al.*, 2005). Beluga whales occur near Port MacKenzie in larger groups during summer (Funk *et al.*, 2005).

Movement and habitat use of belugas in Knik Arm is influenced by tidal fluctuations that result in changes in water depths of up to 39 feet (Funk *et al.*, 2005). Beluga whale use of Knik Arm was high during the fall (August through October), reduced and more sporadic in spring and late fall to winter (April through July and November through early December), with occasional occurrence at other times of year (mid-December through March) (Funk *et al.*, 2005). Beluga whale sightings near Port MacKenzie during the ice-free period (April through August) were concentrated in April (45 percent) and August (40 percent), with the largest number of whales per group occurring in July (30 whales per observation) (Funk *et al.*, 2005).

Beluga whales were sighted near the Port MacKenzie dock during spring (February through April) across all tide ranges (Figures H-6 through H-8; Funk *et al.*, 2005). Belugas were observed within the grid cells at and near the Port MacKenzie dock during all three tidal phases (Figures H-6 through H-8), with the greatest number of group sightings across the Knik Arm Narrows, between Cairn Point and the Point MacKenzie dock, during low- and mid-tidal phases (Figures H-6 and H-7). More beluga groups were observed within the grid cells near the Port MacKenzie dock during low- and mid-tide heights than at high tides during summer (May through July; Figures H-9 through H-11; Funk *et al.*, 2005). Beluga whales were consistently observed within the Knik Arm narrows during the fall (late July through October) at all tide





**Figure H-6. Beluga Whale Group Sightings During Spring (February through April) at Low Tide (< 12 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)**

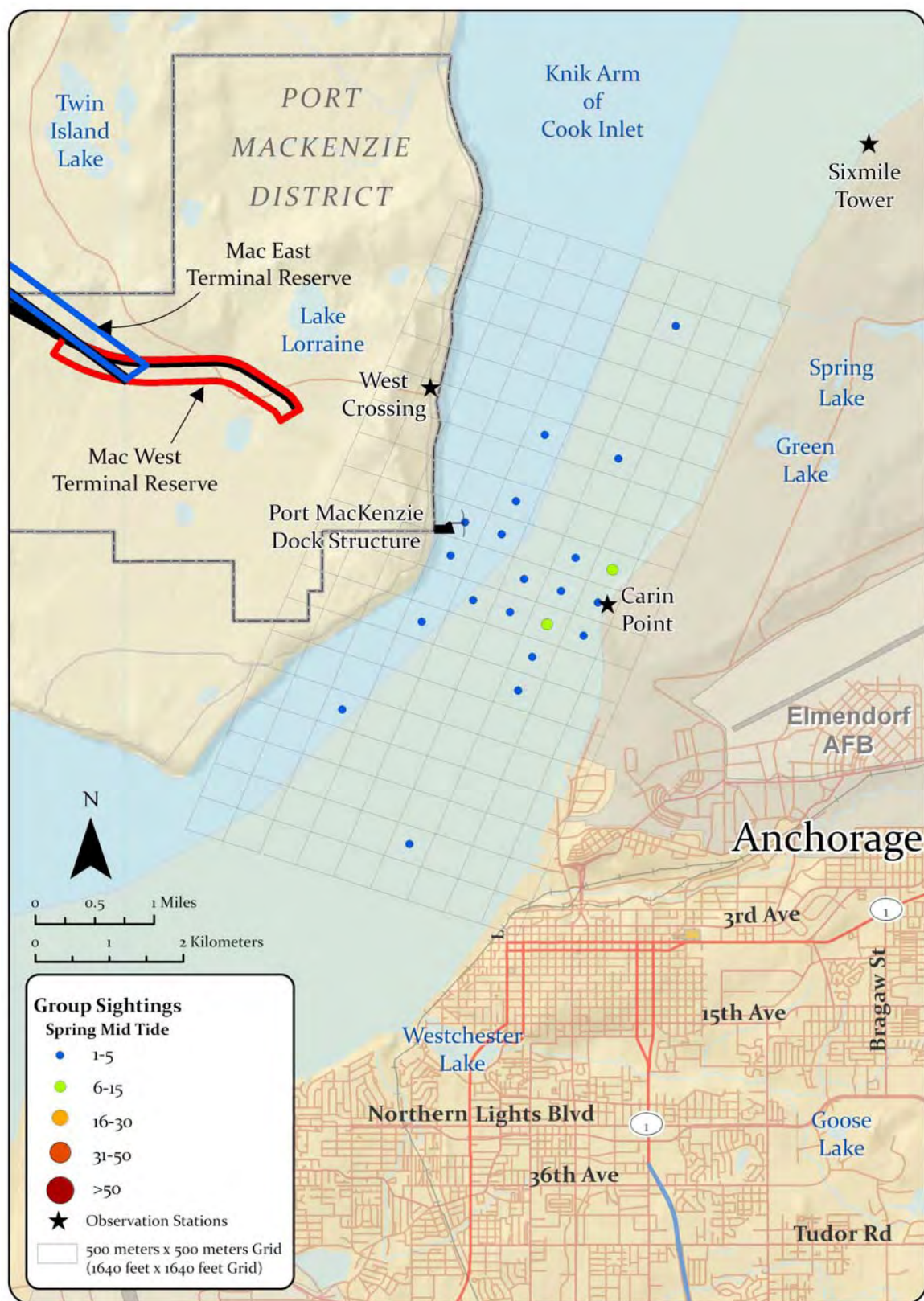


Figure H-7. Beluga Whale Group Sightings During Spring (February through April) at Mid Tide (12 To 22 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)



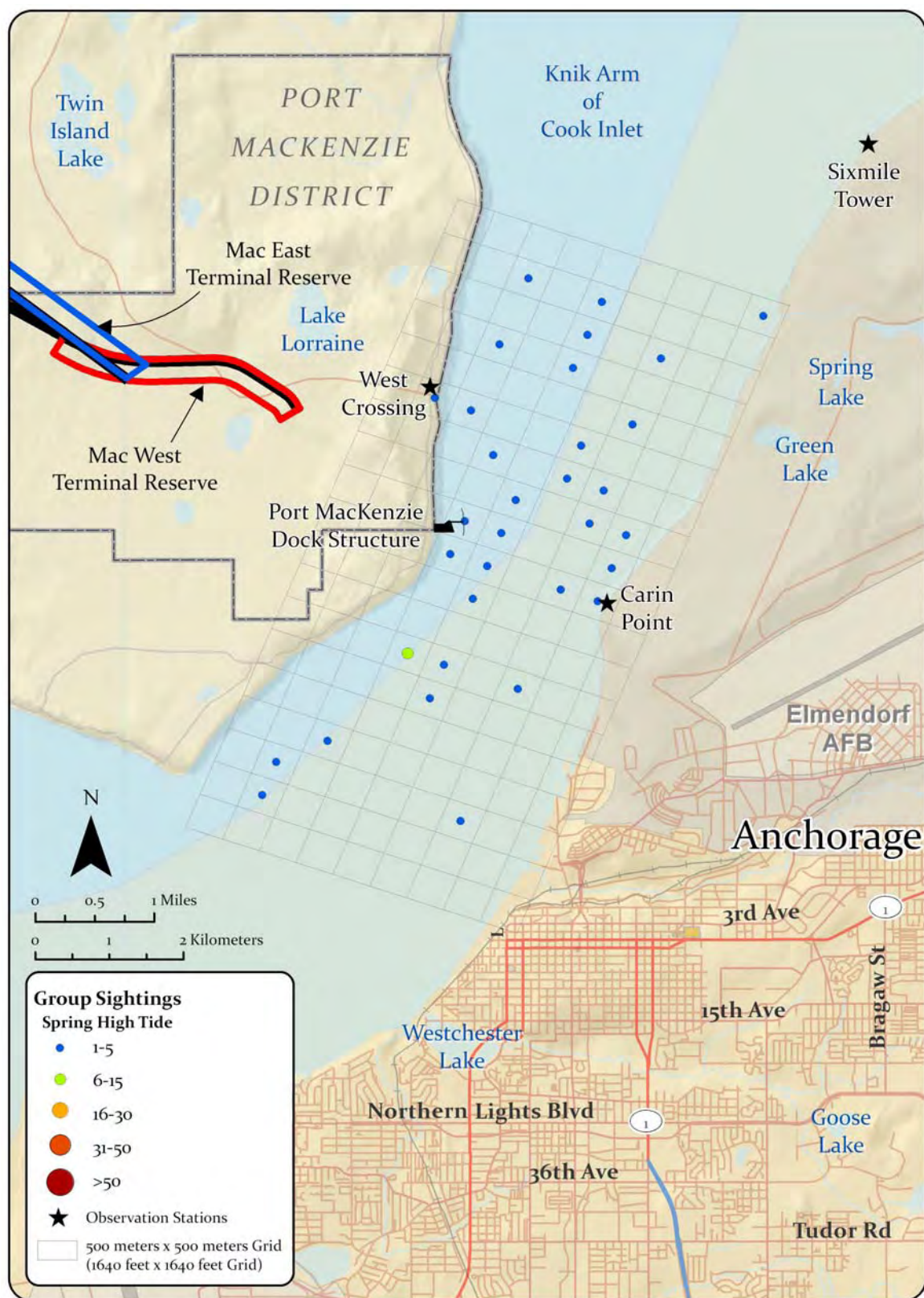


Figure H-8. Beluga Whale Group Sightings During Spring (February through April) at High Tide (>22 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)

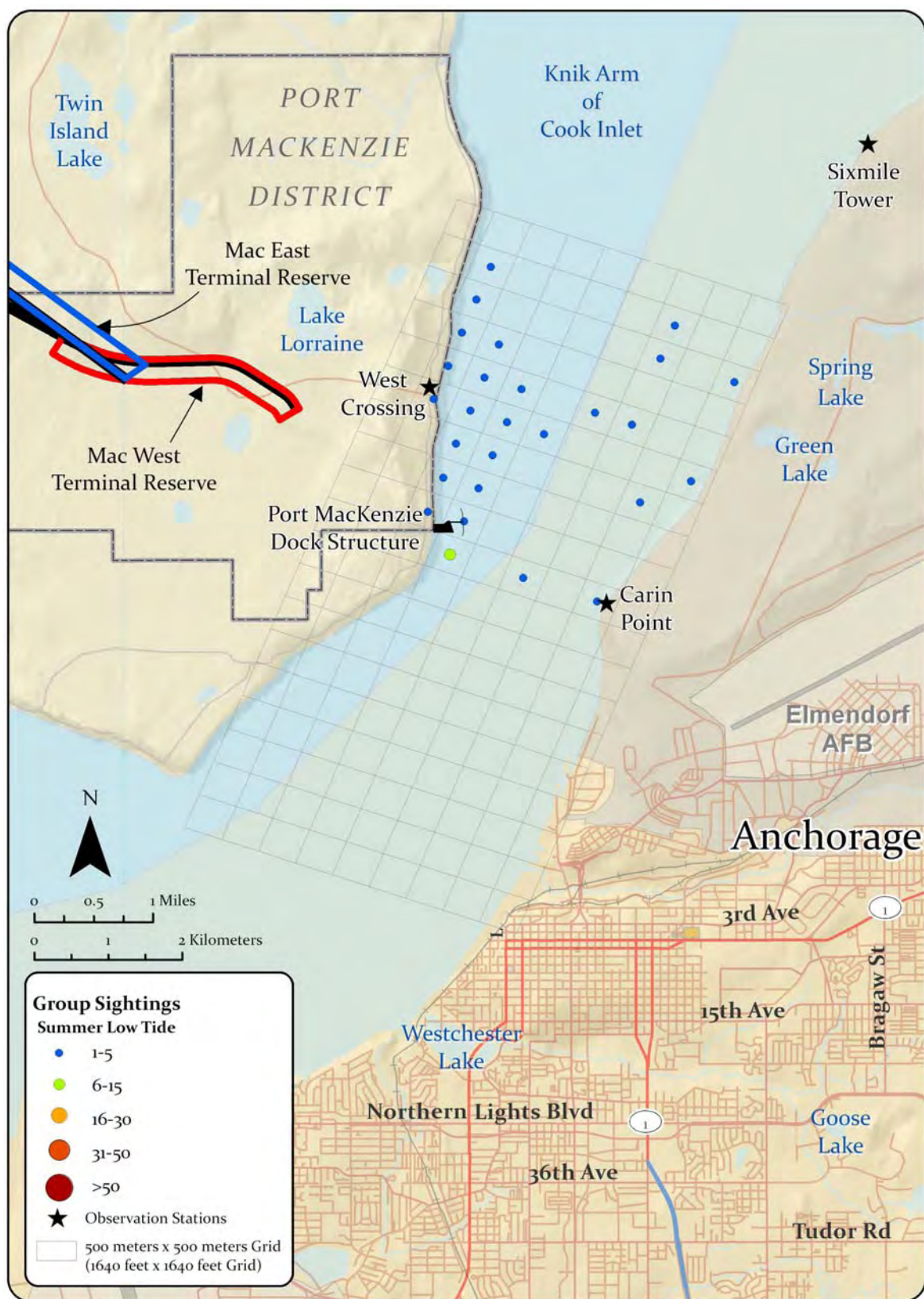
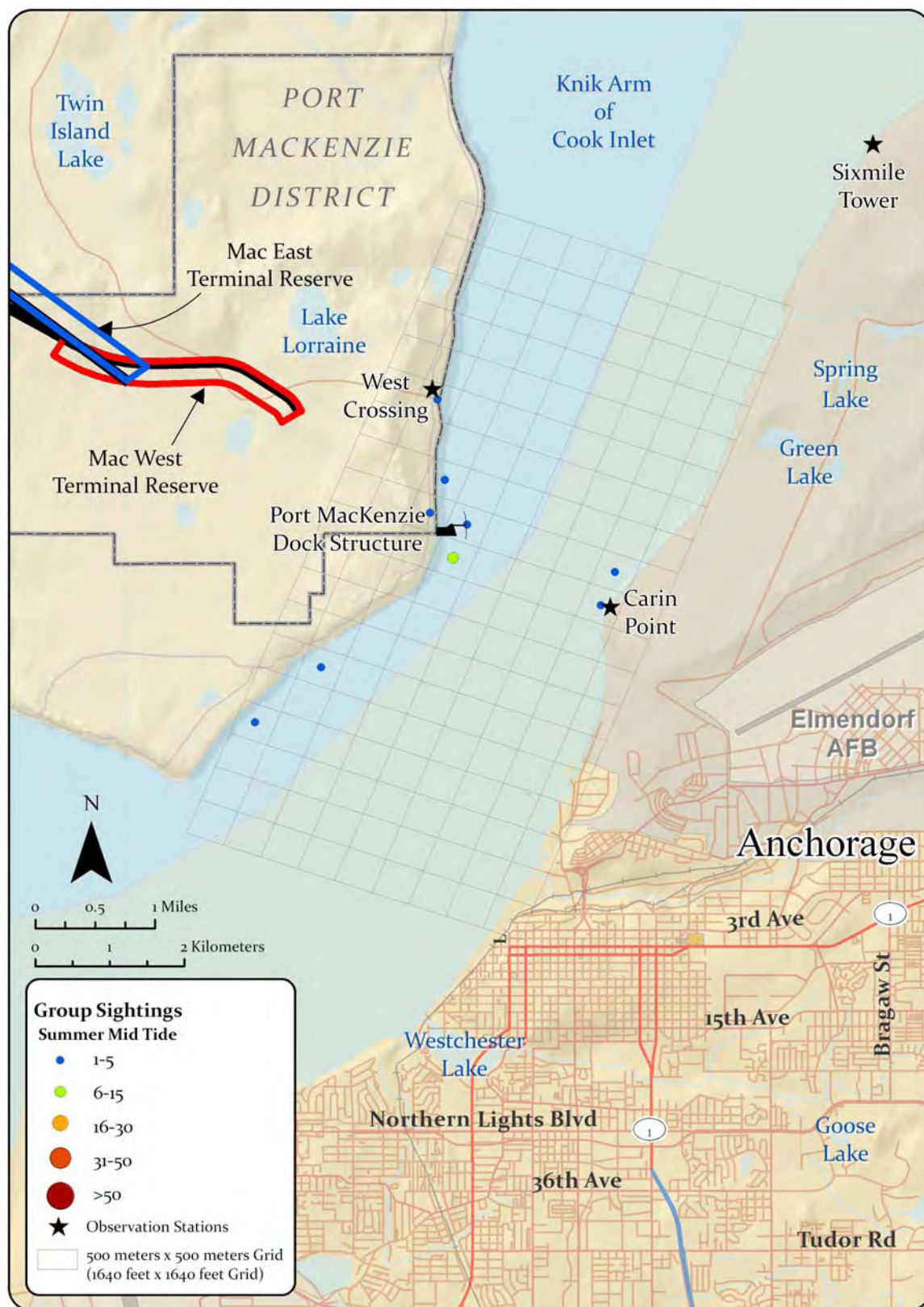
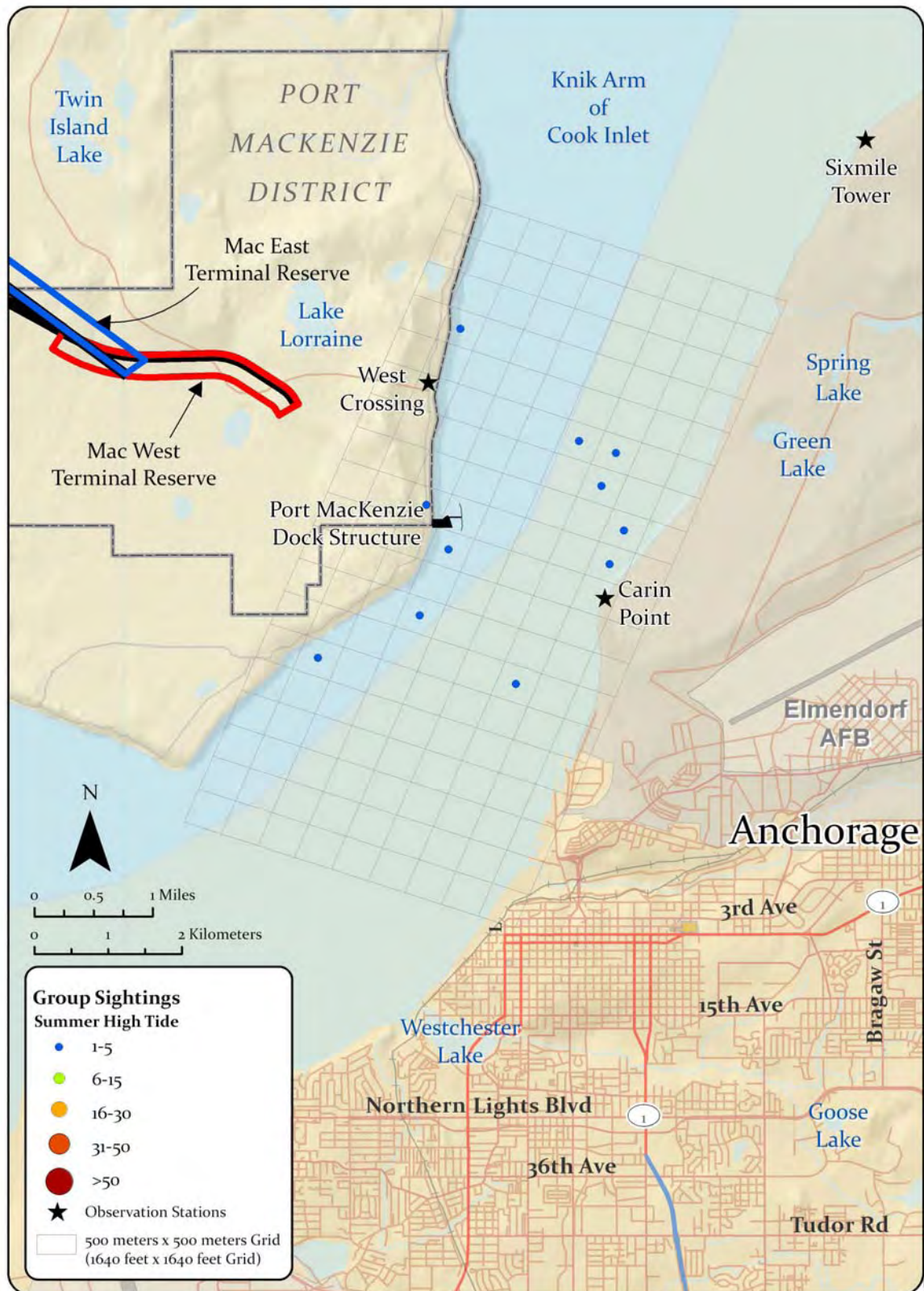


Figure H-9. Beluga Whale Group Sightings During Summer (May through July) at Low Tide (< 12 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)





**Figure H-10. Beluga Whale Group Sightings During Summer (May through July) at Mid Tide (12 To 22 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)**



**Figure H-11. Beluga Whale Group Sightings During Summer (May through July) at High Tide (>22 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)**



stages, with more groups observed during low tide and high tide within grid cells near the Port MacKenzie dock (Figures H-12 through H-14; Funk *et al.*, 2005). No winter monitoring occurred from the station nearest Port MacKenzie (Funk *et al.*, 2005), and few whales were sighted during winter within the Knik Arm Narrows from the observation location on the east side of the Narrows. No beluga whales were sighted near the dock structure during any winter tidal phase, but a few whales were sighted within the Kink Arm narrows during low and mid tide phase, with no sightings during high tide phases in winter (November through January; Figures H-15 and 16; Funk *et al.*, 2005).

Observations of vessel activity from the West Crossing location (labeled West Crossing in Figures) indicated that 600 potential non-aircraft and 9,544 aircraft disturbance events were noted during the 1,098 hours of observation during July and August of 2004 and April through July of 2005 (Funk *et al.*, 2005). Potential non-aircraft disturbances were primarily skiffs (61 percent), followed by tugs and barges (24 percent), and ships (3 percent) (Funk *et al.*, 2005). Potential aircraft disturbances were primarily fighter jets (39 percent) and single propeller aircraft (34 percent) (Funk *et al.*, 2005). During the summer and fall of 2005, Port MacKenzie reported 5 barges and 2 ships operating at Port MacKenzie (Table H-1).

The Knik Arm Narrows is a fairly active and noisy marine terminal area; ambient noise monitoring levels were 115-133 dB re: 1  $\mu$ Pa (Table H-2; Blackwell and Greene, 2002). Vessel traffic to and from the shipping lanes between Fire Island, which is located 3 miles west of the land occupied by Anchorage International Airport, and Point MacKenzie associated with both the Port of Anchorage and Port MacKenzie, and air traffic associated with Elmendorf Air Force Base and the Anchorage International Airport contribute to the relatively high ambient noise monitoring levels (Blackwell and Greene, 2002). Tidal currents increase ambient noise by about 15 dB re: 1  $\mu$ Pa (Table H-2; Blackwell and Greene, 2002).

Shipping noise is produced by the ships' propellers, machinery, passage of the hull through the water, and sonar and depth sounders. Machinery noise is produced by mechanical vibration and is transmitted through the ships hull. Propellers produce noise through vibration and through the creation of bubbles (or cavities) that result from a buildup of low or negative pressure at the tips of the propeller blade. As the bubbles collapse, either in turbulence or against the propeller surface, a sharp pulse of sound is produced and this process is called "cavitation." Most noise from shipping is concentrated in the low frequency range (less than 5 kHz), with noise from container ships and freighters generally at frequencies less than 0.5 kHz, and tugs and barges ranging up to 5 kHz (Table H-2). These frequencies are outside of the relatively high frequencies where beluga whales hear best (10 to 100 kHz), which is generally above the level of much industrial noise (Blackwell and Green, 2002 in National Marine Fisheries Service, 2009). However, beluga whales may hear sounds as low as 0.04 to 0.075 kHz, although this noise would have to be very loud (National Marine Fisheries Service, 2009).

Reactions of beluga whales to vessel traffic are varied depending on the type of vessel, surrounding conditions, and vessel speed. Documented responses have included the following:

1. Changes in vocalizations
  - a. Reduction in calling rate
  - b. Increases in falling tonal calls and three pulsed-tone calls

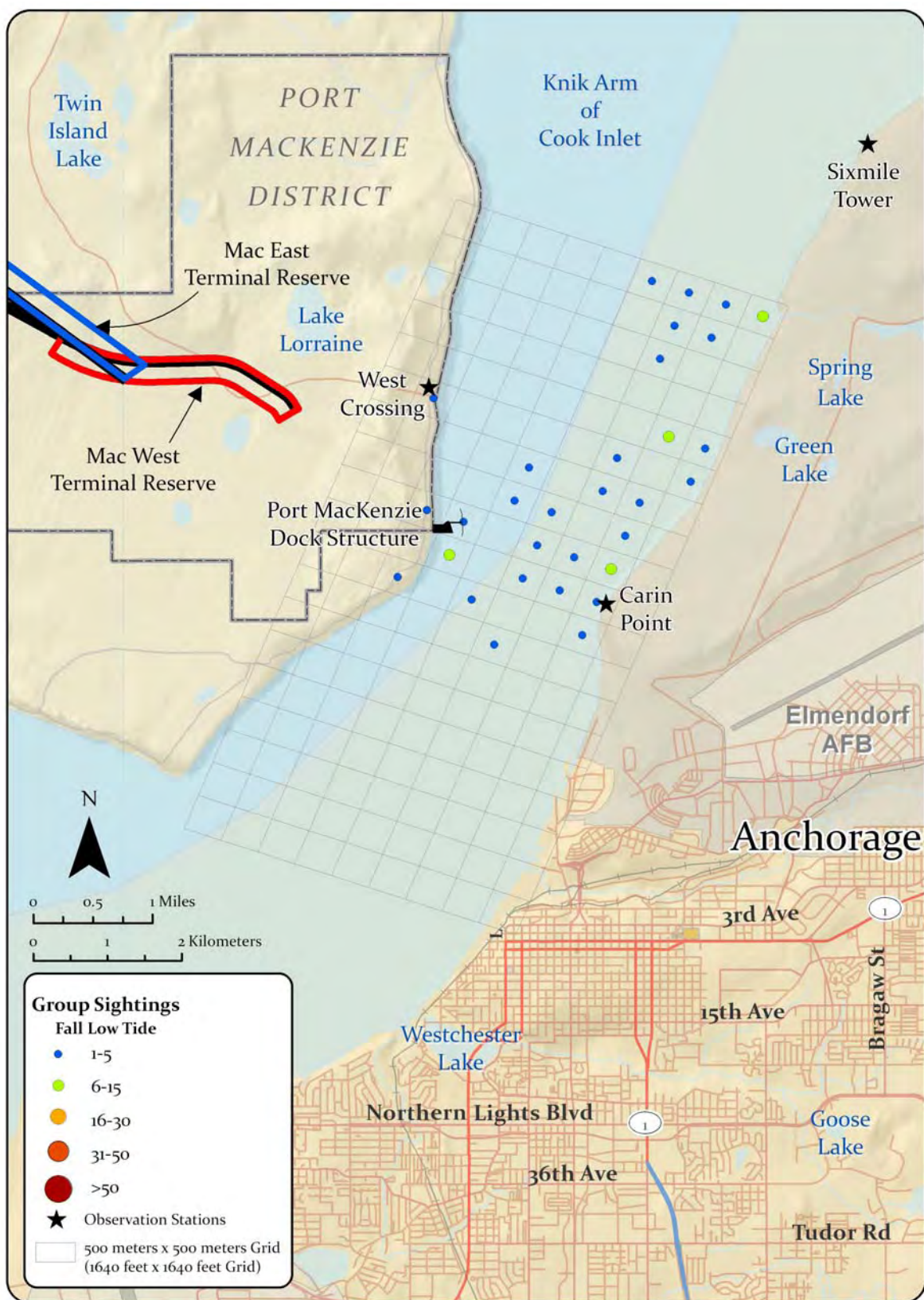
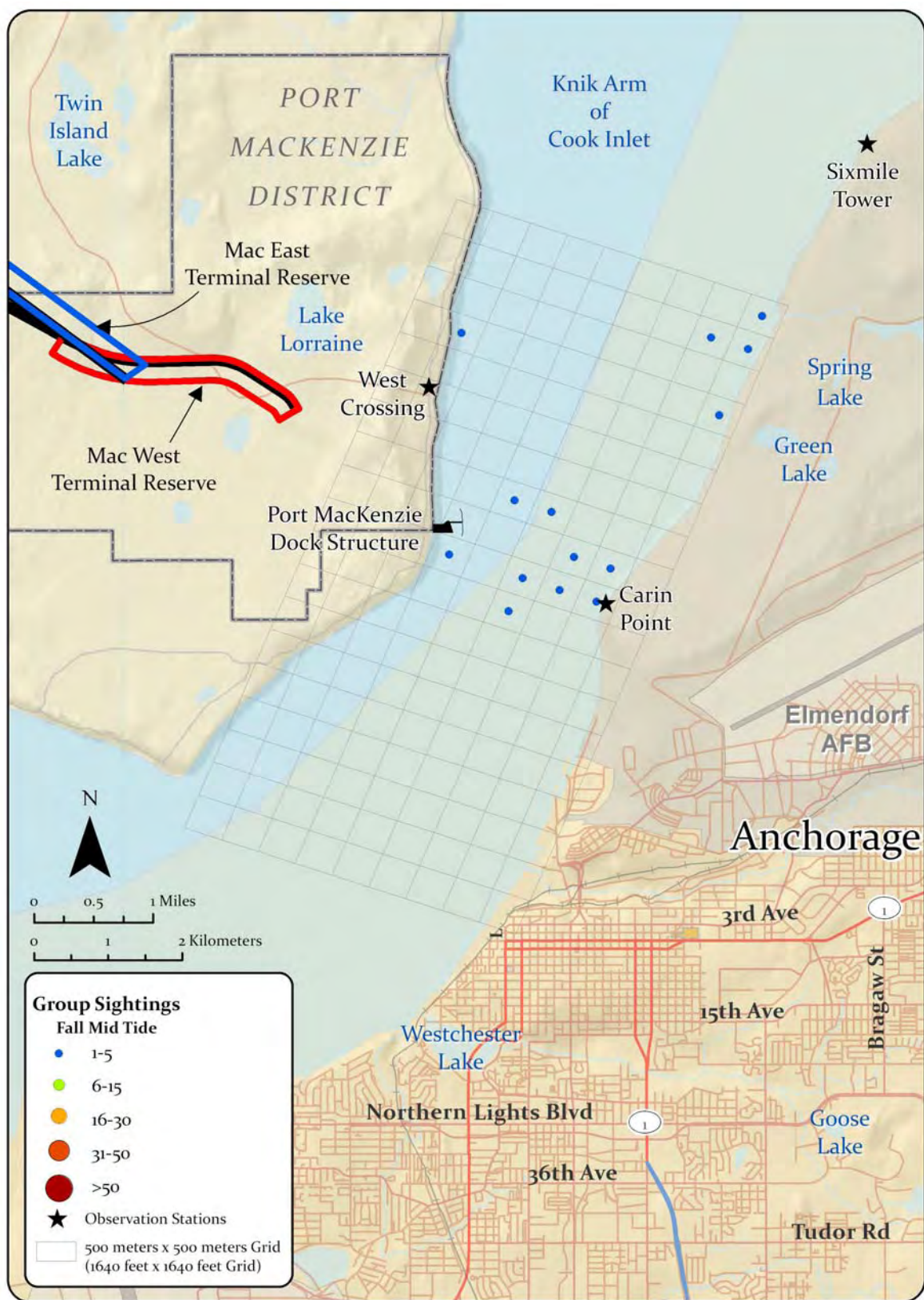


Figure H-12. Beluga Whale Group Sightings During Fall (Late July through October) at Low Tide (< 12 Feet) Near Port MacKenzie; Interpreted From Funk *et al.* (2005)





**Figure H-13. Beluga Whale Group Sightings During Fall (Late July through October) at Mid Tide (12 To 22 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)**

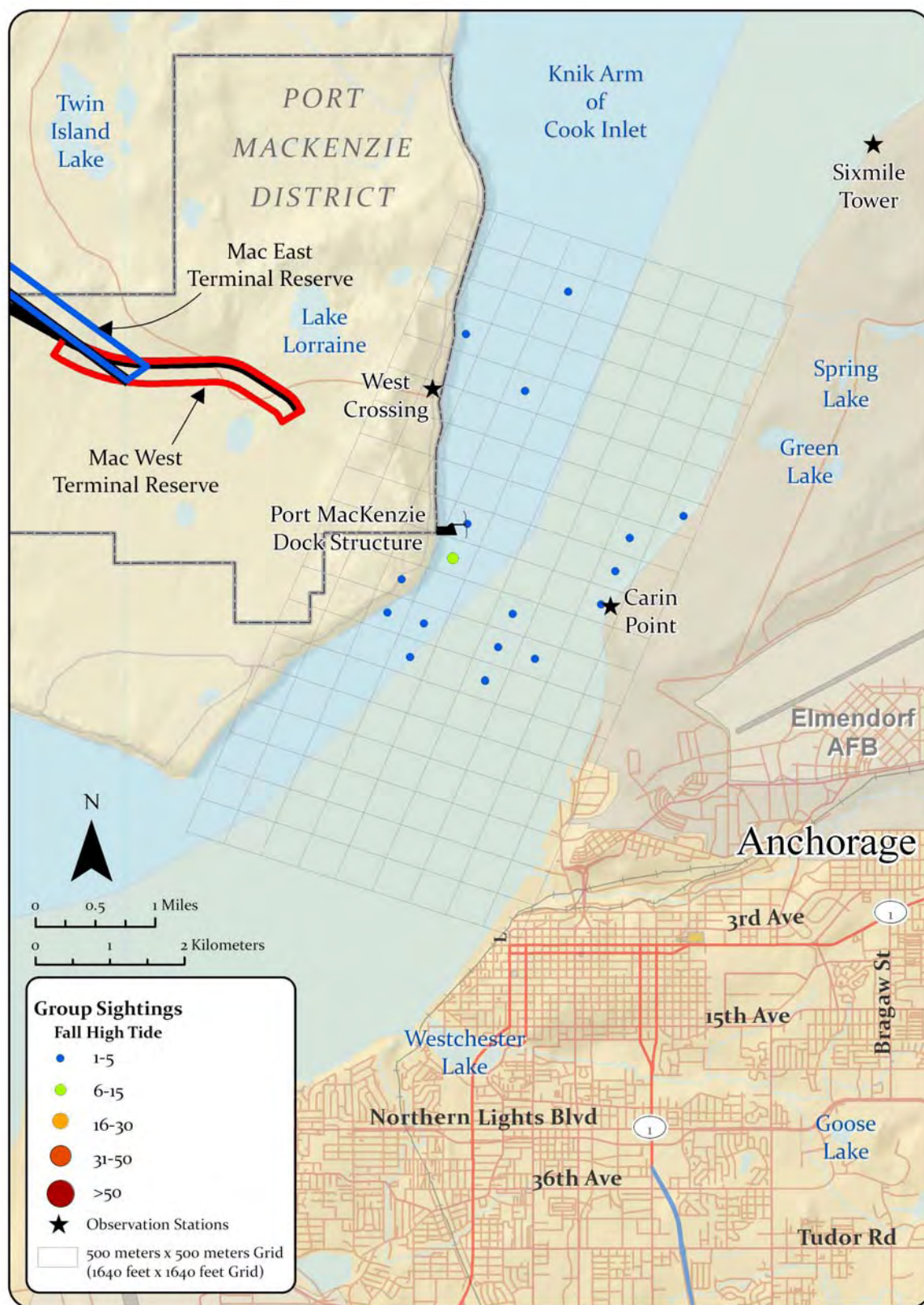
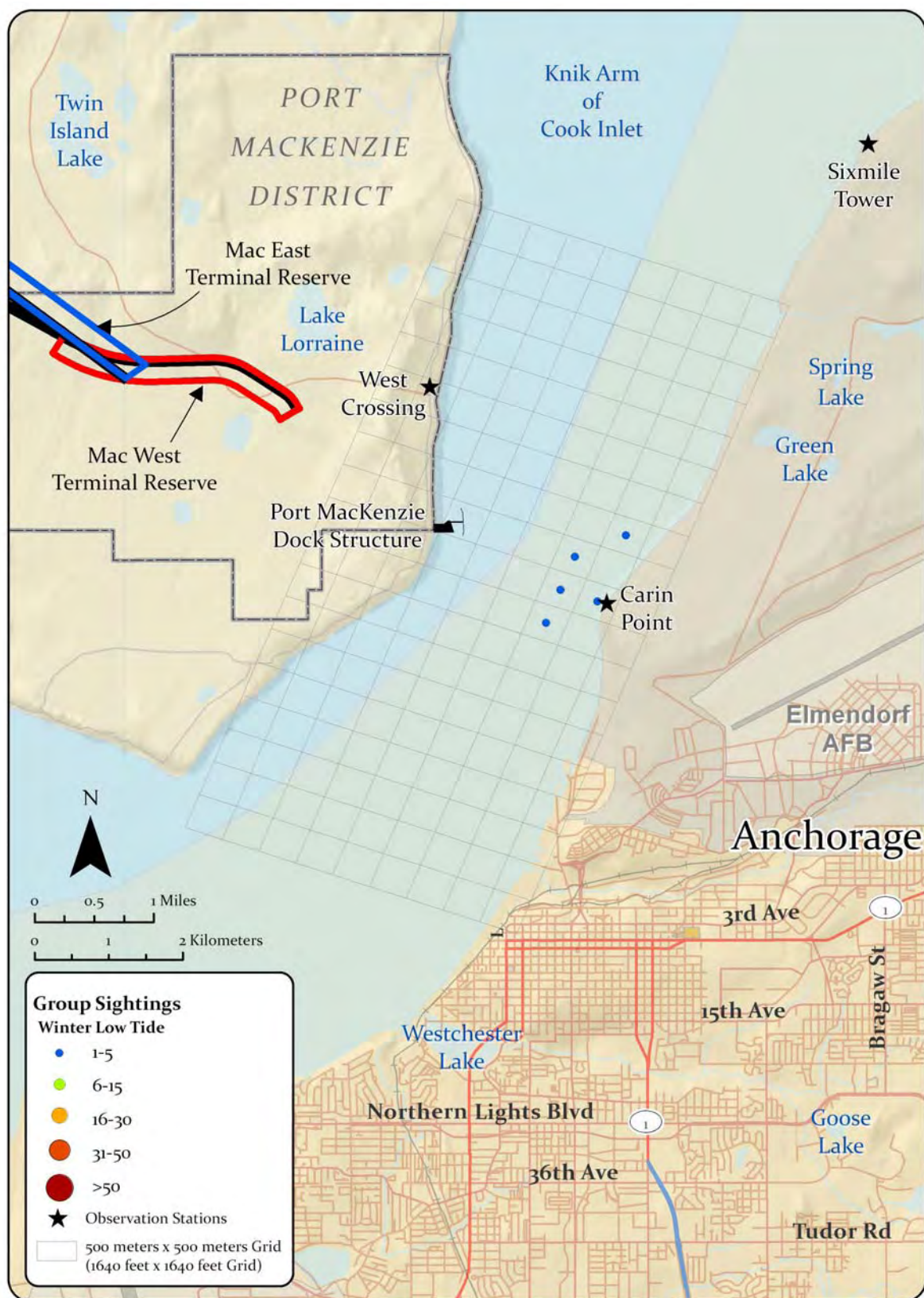
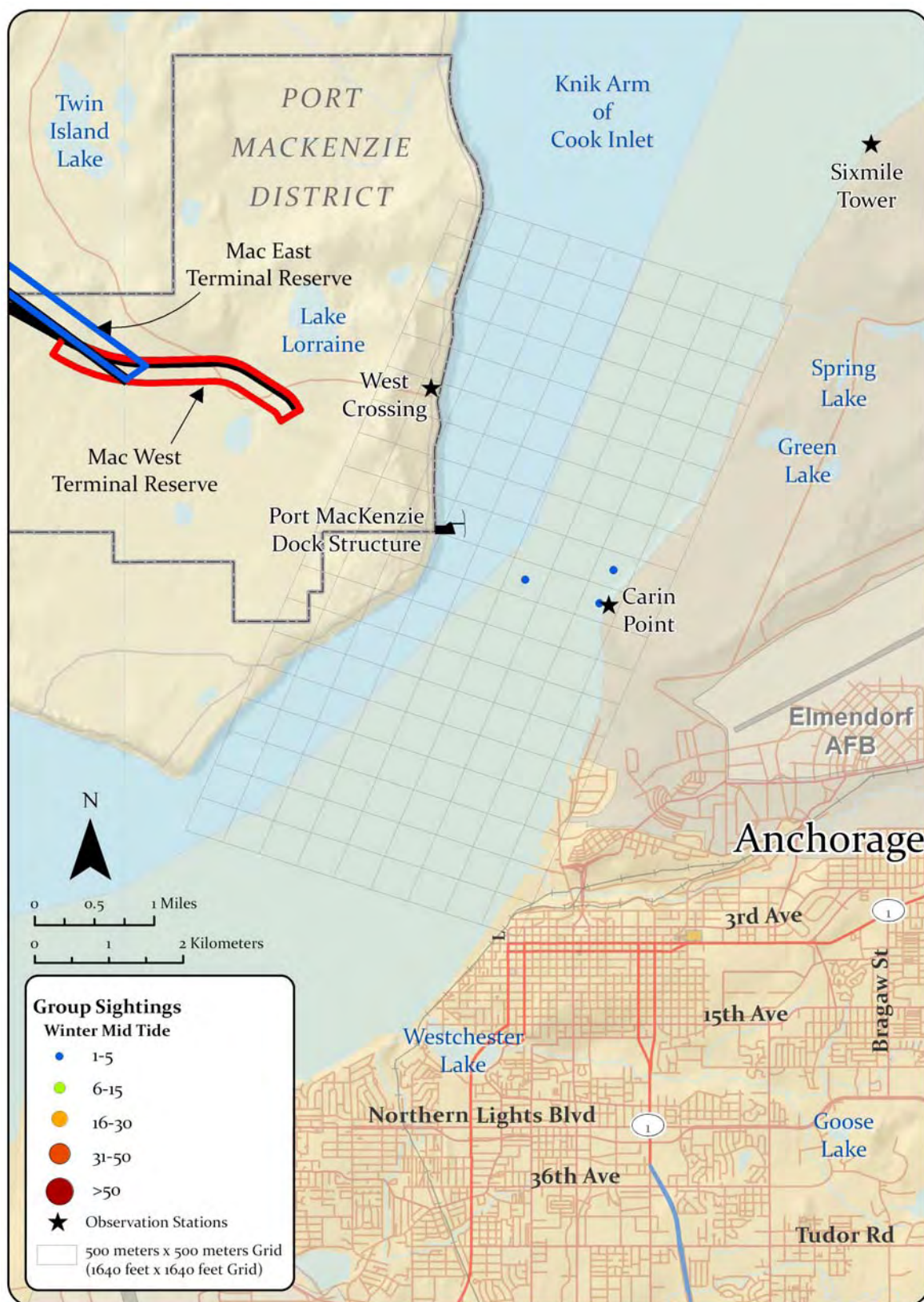


Figure H-14. Beluga Whale Group Sightings During Fall (Late July through October) at High Tide (>22 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)





**Figure H-15. Beluga Whale Group Sightings During Winter (November through January) at Low Tide (< 12 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)**



**Figure H-16. Beluga Whale Group Sightings During Winter (November through January) at Mid Tide (12 To 22 Feet) Near Port MacKenzie; Interpreted from Funk *et al.* (2005)**



**Table H-1**  
**Summary of Vessel Traffic at Port MacKenzie during 2005 to 2008 and the Port of Anchorage during August to November 2005<sup>a</sup>**

Month	Port MacKenzie Vessel Traffic				Port of Anchorage Vessel Traffic <sup>b</sup> (2005)
	2005	2006	2007	2008	
January		-	-	-	-
February	2 (ship)	-	-	-	-
March	1 (ship)	-	-	-	-
April		-	-	-	-
May	3 (barge)	-	-	-	-
June	1 (ship)	-	-	-	-
July	1 (barge)	-	1 (ship)	2 (landing craft)	-
August	1 (barge) 1 (ship)	-	-	185 (barge) <sup>c</sup>	39 per day
September		-	-	-	39 per day
October		-	-	-	22 per day
November		-	-	-	17 per day
December	1 (barge) 1 (ship)	-	-	-	-
<b>Total Annual Ships</b>	<b>12</b>	<b>0</b>	<b>1</b>	<b>187</b>	<b>514</b>

<sup>a</sup> Source: Van Dongen, 2009b; Prevel Ramos *et al.*, 2006; Port of Anchorage & U.S. Department of Transportation, 2005.

<sup>b</sup> Average ships per day reported by Prevel Ramos *et al.* (2006) during beluga whale monitoring may include replicate sightings of ships remaining at port. Ships observed include tankers, tugs, barges, military vessels, and possibly some smaller vessels. Total annual ships for Port of Anchorage as reported by Port of Anchorage & U.S. Department of Transportation (2005). Vessel traffic at the Port of Anchorage was used in calculating the ambient noise due to ship traffic in the Knik Arm. However, as sound underwater attenuates rapidly as the distance from the source increases, this traffic is not relevant to include in the calculation of traffic in the immediate vicinity of Port MacKenzie.

<sup>c</sup> These vessels are associated with gravel transportation for development at the Port of Anchorage. Construction at the Port of Anchorage is slated to continue through 2014. As this work may overlap with operation of the proposed rail line, these 185 vessels were included in the calculation of average annual traffic at Port MacKenzie.

- c. Increase in repetition of specific calls
- d. Shift in frequency bands used for vocalization from 3.6 kHz to 5.2-8.8 kHz

2. Changes in behavior
  - a. Change in group integrity (e.g., splitting and separation)
  - b. Change in surfacing and diving behaviors
  - c. Cessation of feeding
  - d. Change in direction and swimming speed
3. Avoidance behavior
  - a. Avoidance of tugs by more than 2 km
  - b. Movement away from vessel course and displacement for 1-2 days
  - c. Strong reactions to outboard motors
  - d. Reactions to very low levels of received sound (considered to be barely perceptible) (Simmonds *et al.*, 2004)

**Table H-2**  
**Summary of Sound Frequencies and Source Levels Produced by Shipping Traffic and Ambient Noise Levels at Port MacKenzie, the Port of Anchorage and Within Cook Inlet<sup>a</sup>**

Type of Vessel or Location	Frequency (kHz)	Source Level (dB re: 1 µPa)	Measurement Distance
<b>Typical Vessels</b>			
Jetski	0.80-50.0	75-125	-
Rigid Inflatable Boat	6.30	152	-
20 foot – Outboard Motor Boat	0.63	156	-
Fishing Boat	0.25-1.0	151	-
Tug & Empty Barge	0.04-5.0	145-166	-
Tug & Loaded Barge	1.0-5.0	161-170	-
100 foot – Twin Diesel Workboat	0.63	159	-
Containership	0.1-0.5	180	3 feet
Freighter (450 foot)	0.04	172	-
<b>Cook Inlet Vessel Noises</b>			
Northern Lights – Cargo-freight (docked)	-	126	374 feet
Emerald Bulker – Cargo-bulk (with 2 tugs)	-	134	1,770 feet
Leo – Tug (with gravel barge)	0.2-1.0	149	335 feet
Avon Rubber Boat	-	142	28 feet
Overflights – Military Jets	-	122-134	-
Overflights – Commercial Airlines	-	110-124	-
<b>Cook Inlet Underwater Noise Levels</b>			
Birchwood	-	95	-
Mouth of Little Susitna	-	100	-
Anchorage Airport	-	105	-
Shipping Channel – between Fire Island and the Little Susitna River	-	113	-
Anchorage Harbor	-	113	-
Port MacKenzie – including strong currents	0.01-10.0	115-133	-
Port MacKenzie – without currents	-	115-118	-

<sup>a</sup> Source: Simmonds *et al.*, 2004; Richardson *et al.*, 1995 in National Marine Fisheries Service, 2009; Blackwell, 2005; Blackwell & Greene, 2002.

## H.6 Effects Analysis

This section describes the potential indirect effects and interdependent/interrelated effects associated with the proposed project on the beluga whale. SEA, in consultation with the National Marine Fisheries Service, did not identify any direct impacts that would result from construction or operation of the rail line to beluga whales or beluga whale habitats in the waters of Cook Inlet, within the lower reaches of the Sustina River, or the Little Susitna River. Effects were analyzed using information from literature reviews, professional knowledge and experience, and discussions with Federal, state, and consulting biologists.

Threats to the continued survival of the Cook Inlet beluga include: natural threats (e.g., stranding events, predation, parasitism, disease, environmental change) and human impacts (e.g., subsistence harvest, poaching, fishing, pollution, vessel traffic, tourism, whale watching, coastal development, noise, oil and gas activities, scientific research) (National Marine Fisheries Service, 2008). Projects that reduce anadromous fish runs could also negatively impact beluga foraging success (National Marine Fisheries Service, 2008). Activities that could restrict or deter access to Type 1 habitat could reduce beluga calving success, impair their ability to secure prey,

and increase their susceptibility to predation by killer whales (National Marine Fisheries Service, 2008). Concentration of belugas in Type 1 habitat predisposes them to harm from oil spills (National Marine Fisheries Service, 2008).

The proposed rail line could indirectly affect the beluga whale via two mechanisms:

- 1) Potential degradation of forage species habitats in upper Cook Inlet tributary rivers and streams (i.e., anadromous fish resources)
- 2) Potential increased noise and disturbance from vessel loading and unloading, and induced increases in vessel traffic and anchorage near Port MacKenzie

Due to their slower speed and straight line movement, ship strikes from large vessels are not expected to pose a significant threat to Cook Inlet beluga whales (National Marine Fisheries Service, 2009). Because vessels would generally come into port escorted by tugs and at relatively slow speeds, and because beluga whales would be able to avoid these ships, the likelihood of vessel strikes from the increased traffic was considered to be non-existent and will not be further discussed. While no Critical Habitat has yet been designated for the Cook Inlet beluga whale, the indirect effects of increased noise and disturbance from induced increases in vessel traffic near Port MacKenzie would occur within what has been designated as Type 1 habitat (National Marine Fisheries Service, 2008) that may be designated as Critical Habitat for this species.

## **H.6.1 Potential Degradation of Forage Species Habitat**

The proposed rail line alternatives would cross the following drainages important for supporting anadromous fish in the upper Cook Inlet: Willow Creek, Little Willow Creek, Rolly Creek and Fish Creek–Susitna River drainage; the Little Susitna River drainage; Big Lake drainage, Goose Creek drainage; and drainages in the East Susitna Flats. These drainages support between one and five species of Pacific salmon. The lower reaches of the Susitna River support spawning runs of eulachon, another important forage species for belugas.

Construction of the proposed rail line could have adverse impacts on anadromous fish habitats. Proposed project alternatives include construction of bridges and culverts for between 5 and 9 anadromous fish-bearing streams (Table H-3, Figure H-17). Two alternatives would include streambed relocation. Project-related effects on anadromous fish freshwater habitats at proposed stream crossings could include:

- Loss or alteration of instream and riparian habitats
- Mortality from instream construction
- Blockage of fish movements
- Degradation of water quality
- Alteration of stream hydrology and breakup
- Noise and vibration impacts

**Table H-3**  
**Summary of Anadromous Fish-Bearing Streams Crossed by Alternatives<sup>a</sup>**

	Mac West - Conn 1 - Willow	Mac West - Conn 1 - Houston - Houston North	Mac West - Conn 1 - Houston - Houston South	Mac West - Conn 2 - Big Lake	Mac East - Conn 3 - Willow	Mac East - Conn 3 - Houston - Houston North	Mac East - Conn 3 - Houston - Houston South	Mac East - Big Lake
<b>Fish Communities</b>								
Anadromous	7	9	6	8	6	8	5	8
<b>Habitat</b>								
Spawning	6	3	2	2	6	3	2	2
Rearing	7	9	6	8	6	8	5	8
Migration	7	7	6	8	6	6	5	8
Over-Winter	5	5	5	4	5	5	5	4
<b>Conveyance Structure</b>								
Bridge	4	1	1	0	4	1	1	0
Culvert	2	5	3	1	1	4	2	1
Drainage Structure <sup>b</sup>	1	3	2	6	1	3	2	6
Relocation	0	0	0	1	0	0	0	1
<b>Total Crossings</b>	<b>7</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>6</b>	<b>8</b>	<b>5</b>	<b>8</b>

<sup>a</sup> Source: Johnson and Daigneault, 2008; Noel *et al.*, 2008.

<sup>b</sup> Drainage structures would be determined during the final design process and could include multi-plate culverts, pre-cast arches, and single or multiple short span bridges.

Loss or alteration of instream and riparian habitats would result in reduced capacity of the habitats to produce anadromous fish. Blockage of fish movement could further limit available fish habitat, also resulting in reduced capacity of the habitat to produce anadromous fish. Because beluga whales compete with both commercial and recreational fisheries for available anadromous fisheries resources, and because the configuration of the river mouth appears to be critical to beluga whale feeding efficiency (National Marine Fisheries Service, 2008), small changes in available anadromous fish resources within Type 1 habitats of the upper Cook Inlet could have a disproportionate effect on beluga whales.

In addition to the Applicant's voluntary measures listed above, SEA has developed the following preliminary measures to protect anadromous fish freshwater habitats.

- Unless otherwise approved by the Alaska Department of Fish and Game, project-related detonation of explosives within, beneath, or in proximity to fish-bearing waters shall not result in overpressures exceeding 2.7 pounds per square inch unless the water body, including its substrate, was frozen solid. Peak particle velocity stemming from explosive detonation shall not exceed 0.5 inches per second during the early stages of egg incubation.
- The Applicant shall not narrow an anadromous water body between its mean high water lines for the project, unless authorized in writing by Alaska Department of Fish and Game (ADF&G) prior to project-related construction, thereby enabling ADF&G to apply reasonable design criteria or requirements.

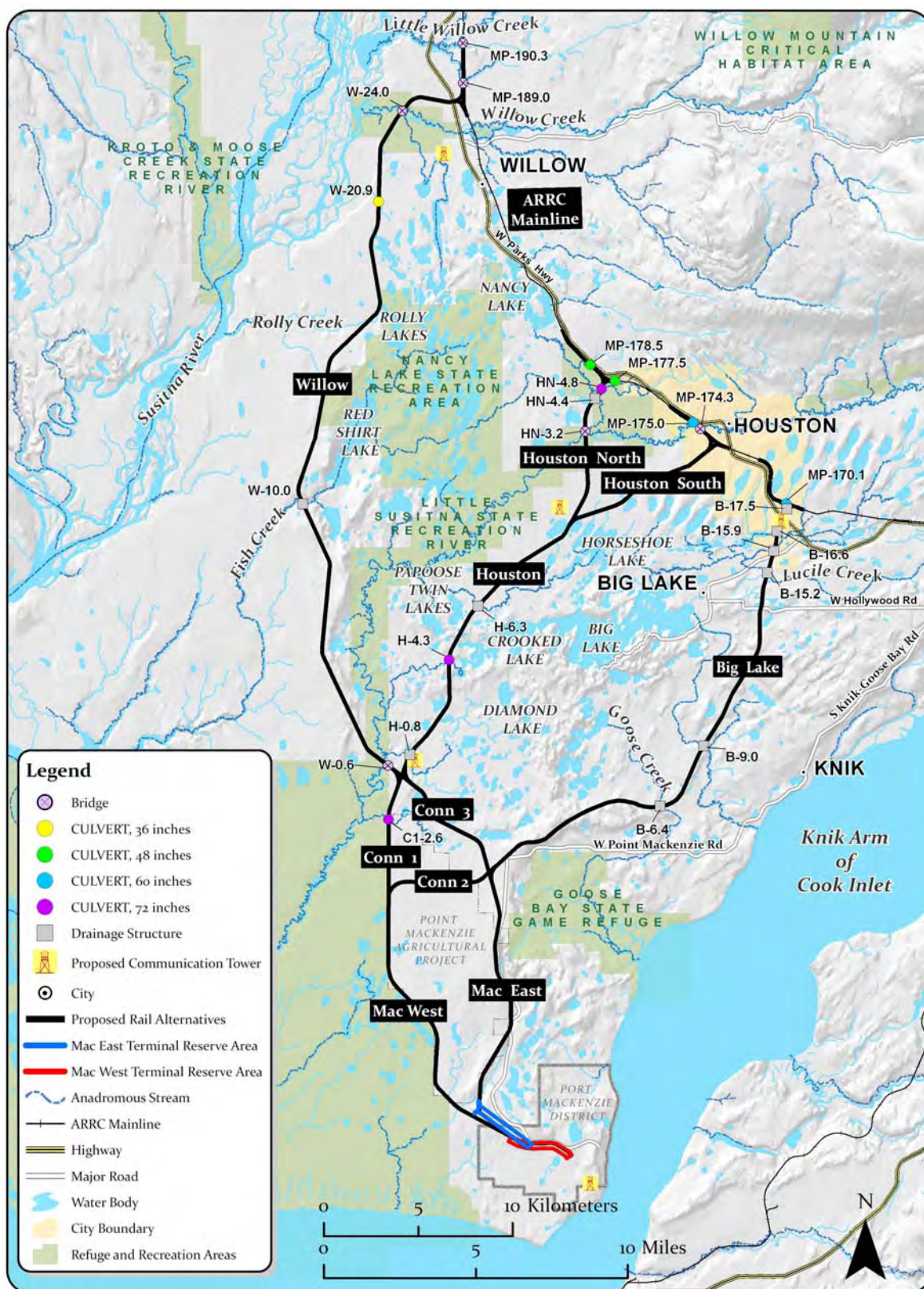


Figure H-17. Anadromous Fish-Bearing Streams Crossed by the Port MacKenzie Rail Extension Alternatives (Johnson and Daigneault, 2008; Noel et al., 2008)

- During project construction, the Applicant shall not clear riparian vegetation within 100 feet of fish-bearing water bodies and 50 feet of non-fish bearing water bodies and emergent wetlands, unless approved by the Alaska Department of Natural Resources.
- The Applicant shall design, construct, and operate the rail line and associated facilities, including bridge abutments, to maintain existing water patterns and flow conditions and provide long-term hydrologic stability by conforming to natural stream gradients and stream channel alignment and avoiding altered subsurface flow, to the extent practicable. Project-related supporting structures (e.g. bridge piers) shall be designed to minimize scour and increased flow velocity, to the extent practicable.
- During project-related design, the Applicant shall align road and track crossings of water bodies perpendicular or near perpendicular to water bodies, where practicable, to minimize crossing length and potential bank disturbance.
- During project-related construction, the Applicant shall remove all project-related construction debris (including construction materials, soil, or woody debris) from water bodies, including wetlands, as soon as practicable during the open-water period, or prior to break-up for debris on top of or within ice or snow crossings.
- The Applicant shall follow all applicable Federal regulations and standard protocols for transporting hazardous substances and other deleterious compounds to minimize the potential for a spill occurrence near or adjacent to water bodies.
- The Applicant shall ensure that all project-related culverts and bridges are sufficiently clear of debris to avoid stream-flow alteration and increased flooding. The Applicant shall inspect all drainages, bridges, and culverts semi-annually (or more frequently, as seasonal flows dictate) for debris accumulation and remove and properly dispose of debris promptly.
- The Applicant shall comply with the reasonable requirements of Alaska Statute (AS) 16.05.841, Fishway Required, and AS 16.05.871, Protection of Fish and Game, regarding project-related winter ice bridge crossings and summer ford crossings of all anadromous and resident fish streams. If necessary, natural ice thickness could be augmented (through removing snow, adding ice or water, or other technique) if site-specific conditions, including water depth, are sufficient to protect fish habitat and maintain fish passage.
- Prior to construction, the Applicant shall complete jurisdictional delineations of wetlands and other surface waters that are subject to Section 404 of the Clean Water Act for all associated facilities proposed outside of the right-of-way.
- Prior to initiating project-related construction activities, the Applicant shall mark stream channels and existing culvert locations in the project construction area before snowfall obscures their location to avoid damage to these areas.
- The Applicant shall construct project-related water crossings in a manner that minimizes disturbances to streambeds, streambanks, and flow. Measures to meet these goals could include installing bridge piers during the winter, and initially constructing permanent project-



related crossing structures, when practicable, to avoid the need to construct both temporary and permanent crossing structures.

- Prior to construction, the Applicant shall consult with the Alaska Department of Environmental Conservation or other regulatory agencies to determine appropriate regulations and associated requirements for project-related tank storage facilities. At a minimum, the Applicant shall place tank storage facilities as far as practicable from streams or rivers, and implement secondary containment measures (e.g., use of lined and bermed pits).
- The Applicant shall direct the operators of project-related vehicles to not drive in or cross streams other than at crossing points determined by the Alaska Department of Environmental Conservation and U.S. Army Corps of Engineers.
- During final design of the project, the Applicant shall conduct all siting, design, and development of the rail line and associated facilities according to the reasonable requirements within the jurisdiction of the Alaska Department of Natural Resources and the Alaska Department of Fish and Game.
- The Applicant shall return all project-related stream crossing points to their preconstruction contours to the extent practicable.
- The Applicant shall implement all reasonable best management practices imposed by the U.S. Army Corps of Engineers' (USACE) Section 404 Permit under the Clean Water Act to minimize project-related impacts to waters of the U.S., including wetlands. Standard best management practices are specified in the USACE Alaska District's Nationwide Permits General Best Management Practice Guide (U.S. Army Corps of Engineers, 2007. "Nationwide Permits: General Best Management Practices." Alaska District, Regulatory Program. Online at: <http://www.poa.usace.army.mil/reg/NWPs.htm>). and could include the following:
  - Containing sediment and turbidity at the work site by installing diversion or containment structures.
  - Disposing of dredge spoils or unusable excavated material not used as backfill at upland disposal sites in a manner that minimizes impacts to wetlands.
  - Revegetating wetlands as soon as possible, preferably in the same growing season, by systematically removing vegetation, storing it in a manner to retain viability, and replacing it after construction to restore the site.
  - Using fill materials that are free from fine material.
  - Stockpiling topsoil and organic surface material, such as root mats, separately from overburden and shall return it to the surface of the restored site.
  - Dispersing the load of heavy equipment such that the bearing strength of the soil (the maximum load the soil can sustain) is not exceeded. Suitable methods could include, but are not limited to, working in frozen or dry ground conditions, employing mats when working in wetlands or mudflats, and using tracked rather than wheeled vehicles.

- Using techniques such as brush layering, brush matting, live siltation (a revegetation technique used to trap sediment), jute matting and coir logs to stabilize soil and reestablish native vegetation.

## **H.6.2 Increased Vessel Traffic**

Shipping traffic and associated noise from ships and loading facilities have the potential to displace belugas from the port area. Increased shipping traffic that could be induced by operation of the proposed rail line has a potential to restrict or deter access of belugas to Type 1 habitat in the Knik Arm through noise and disturbance. Operation of the rail line including export of bulk materials from Port MacKenzie, would potentially increase vessel traffic in Knik Arm from an average of 50 ships per year during 2005 to 2008 (Table H-1) to as many as 55 and up to 63 ships per year (ARRC, 2009) depending on market conditions.

National Marine Fisheries Service is currently in the process of developing new criteria to determine what constitutes “take” of a marine mammal under the Marine Mammal Protection Act (MMPA) and ESA as a result of exposure to anthropogenic noises in the marine environment (70 FR 1871 and National Marine Fisheries Service, 2009). National Marine Fisheries Service currently uses generic exposure level thresholds under the MMPA’s Level A and Level B harassment definitions to determine harassment “take” (70 FR 1871 and National Marine Fisheries Service, 2009). Level A harassment is defined as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild. The current Level A (injury) underwater noise threshold for cetaceans (whales, dolphins, and porpoises) is 180 dB re: 1  $\mu$ Pa. Level B harassment includes actions that have the potential to disturb a marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. The current Level B (disturbance) underwater noise threshold for cetaceans is 160 dB re: 1  $\mu$ Pa for impulse noise and 125 dB re: 1  $\mu$ Pa for continuous noise (70 FR 1871 and National Marine Fisheries Service, 2009). Shipping vessels produce low frequency sounds at pressure levels generally below the 180 dB re: 1  $\mu$ Pa level (Table H-2), the level considered to cause Level A (injury) harassment. Beluga exposure to sound pressure levels and potential effects sound can have on belugas depends on both the source and the whale’s distance from the source, and the intensity, frequency and duration, behavior of the whale, and the acoustic environment. Much of upper Cook Inlet is characterized by its shallow depth, sand and mud bottoms, and high background noise from currents and glacial till thereby making it a poor acoustic environment (Blackwell and Greene, 2002 in National Marine Fisheries Service, 2009). In general, marine mammals can reduce the level of sound pressure to which they are exposed by moving away from the source. Belugas occurring near the Port MacKenzie facilities might be exposed to sound pressure levels exceeding 160 dB re: 1  $\mu$ Pa, but are unlikely to be exposed to sound pressure levels exceeding 180 dB re: 1  $\mu$ Pa. While large ships generate some broadband noise, the majority of this sound energy would fall below the hearing range of beluga whales and is not expected to elicit behavioral reaction (National Marine Fisheries Service, 2009). Large vessel frequencies are outside the range of beluga whale hearing and vocal communications, and sound pressure levels would attenuate within short distances from the source to levels well below the Level B harassment threshold of 160 dB re: 1  $\mu$ Pa. In addition, as no replacement for the barge traffic to the Port of Anchorage is expected at this time, the vessel traffic at Port MacKenzie would likely be lower in the future, resulting in even less exposure to sound pressure.

Based on the observations of beluga whales illustrated in Figures H-6 to H-16, and summarized in Table H-4, for areas within about 1,000 feet of the Port MacKenzie dock, 90 groups of beluga whales—an estimated 540 individuals, if each group contains an estimated 6 belugas—could potentially be displaced from the area within about 1,000 feet of the dock by increased vessel activity induced by the proposed rail line over the course of a year (or annually), primarily during spring through fall. Individual groups and individual whales would potentially be exposed to noise and traffic disturbance multiple times over the course of the year.

<b>Table H-4</b> <b>Estimate of Beluga Whale Groups Occurring Within 1,000 Feet of the Port MacKenzie Dock<sup>a, b</sup></b>												
Season - Tide	NW of Dock (K2)			At Dock (K3)			South of Dock (J3)			Dock Area		
	Min	Max	Mid	Min	Max	Mid	Min	Max	Mid	Min	Max	Mid
Spring - Low	0	0	0	1	5	3	1	5	3	2	10	6
Spring - Mid	0	0	0	1	5	3	1	5	3	2	10	6
Spring - High	0	0	0	1	5	3	1	5	3	2	10	6
<i>Spring Total</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>3</i>	<i>15</i>	<i>9</i>	<i>3</i>	<i>15</i>	<i>9</i>	<i>6</i>	<i>30</i>	<i>18</i>
Summer - Low	1	5	3	1	5	3	6	15	10.5	8	25	16.5
Summer - Mid	1	5	3	1	5	3	6	15	10.5	8	25	16.5
Summer - High	1	5	3	0	0	0	1	5	3	2	10	6
<i>Summer Total</i>	<i>3</i>	<i>15</i>	<i>9</i>	<i>2</i>	<i>10</i>	<i>6</i>	<i>13</i>	<i>35</i>	<i>24</i>	<i>18</i>	<i>60</i>	<i>39</i>
Fall - Low	1	5	3	1	5	3	6	15	10.5	8	25	16.5
Fall - Mid	0	0	0	0	0	0	1	5	3	1	5	3
Fall - High	0	0	0	1	5	3	6	15	10.5	7	20	13.5
<i>Fall Total</i>	<i>1</i>	<i>5</i>	<i>3</i>	<i>2</i>	<i>10</i>	<i>6</i>	<i>13</i>	<i>35</i>	<i>24</i>	<i>16</i>	<i>50</i>	<i>33</i>
Winter - Low	0	0	0	0	0	0	0	0	0	0	0	0
Winter - Mid	0	0	0	0	0	0	0	0	0	0	0	0
Winter - High	0	0	0	0	0	0	0	0	0	0	0	0
<i>Winter Total</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Annual - Low	2	10	6	3	15	9	13	35	24	18	60	39
Annual - Mid	1	5	3	2	10	6	8	25	16.5	11	40	25.5
Annual - High	1	5	3	2	10	6	8	25	16.5	11	40	25.5
<b><i>Annual Total</i></b>	<b><i>4</i></b>	<b><i>20</i></b>	<b><i>12</i></b>	<b><i>7</i></b>	<b><i>35</i></b>	<b><i>21</i></b>	<b><i>29</i></b>	<b><i>85</i></b>	<b><i>57</i></b>	<b><i>40</i></b>	<b><i>140</i></b>	<b><i>90</i></b>

<sup>a</sup> Source: interpreted from Funk *et al.* (2005)

<sup>b</sup> Note: Sighting records may involve multiple resightings of the same groups and individuals over the course of a year.

As many as 62 percent (an average of 24 percent) of Cook Inlet beluga whales use the Knik Arm during June and July (Figure H-4), having passed through the Knik Arm Narrows and between the Port of Anchorage and Port MacKenzie. A potentially larger proportion of the population uses the Knik Arm during fall (Funk *et al.*, 2005). The Port MacKenzie area currently has relatively high levels of noise related to construction, shipping, and aircraft, but continues to be used by beluga whales. The Port MacKenzie bulk loading facility does not produce significant levels of noise during operation (Van Dongen, 2009a). Belugas would be expected to continue to travel through this area, consistent with the primary observed behavior of whales in this area (Funk *et al.*, 2005). Belugas may dive, rest, and feed less frequently near the Port MacKenzie dock while ships are at the dock.

The National Marine Fisheries Service has recommended the following conservation measures that relate to ship traffic for Port MacKenzie expansion (Mecum, 2008):

1. Belugas shall not be exposed to sound levels in excess of 180 dB re: 1 $\mu$ Pa (160 dB re: 1  $\mu$ Pa without a Small Take Authorization). The radius surrounding such noise sources should be determined empirically and established based on propagation loss equations fit to the data.
2. No ships or boats working with Port MacKenzie should anchor or travel north of Cairn Point in Knik Arm.
3. Minimize beluga exposure to construction, vessel, dredging, and operational noise resulting from Port MacKenzie. Develop, in consultation with the National Marine Fisheries Service, an underwater noise reduction plan through the use of structural design, operational procedures, and encouraging vessel modifications to reduce propeller cavitation noise.

Port MacKenzie monitored construction noise produced during recent dock expansion activities (Blackwell, 2005), but does not currently have an underwater noise reduction plan for normal port operations (Van Dongen, 2009a).

### H.6.3 Interrelated or Interdependent Actions

An interrelated action is an activity that is part of the proposed action and depends on the proposed action for its justification. There are no interrelated activities associated with the proposed project. An interdependent action is an activity that has no independent utility apart from the action under consultation. Projected future expansion of Port MacKenzie by the Matanuska-Susitna Borough, which could have potential direct impacts on the Cook Inlet beluga, is not a component of the proposed rail line, would have independent utility, and is therefore not an interdependent activity.

## H.7 Determination of Effect

SEA has determined that construction and operation of the proposed Port MacKenzie Rail Extension *may affect, but is not likely to adversely affect* the Cook Inlet beluga whale, or its access to Type 1 habitats within the Knik Arm. Development of avoidance, minimization, and mitigation measures for potential construction- and operation-related impacts during consultation with the National Marine Fisheries Service would likely eliminate or reduce potential significant effects to the 5 to 9 anadromous fish stream habitats that would be crossed by proposed project alternatives, such that changes in anadromous fish runs that support beluga whales would not be expected to occur as a result of the proposed project. Provided that Port MacKenzie adopts the conservation measures recommended by the National Marine Fisheries Service that would reduce potential affects of port operation on noise and disturbance to the Cook Inlet beluga whale, expanded port activities that could be induced by operation of the proposed rail line would not be expected to create noise and disturbance sufficient to affect the continued use by the beluga whale of the Knik Arm and areas near Port MacKenzie.

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# **APPENDIX I**

## **CULTURAL RESOURCES**



# I. CULTURAL RESOURCES

This appendix supports the analysis of impacts to cultural resources reported in Chapter 6 of the Port MacKenzie Rail Extension Environmental Impact Statement. Table I-1 lists Dena'ina place names in the proposed rail extension study area, and provides English translations of those place names and a brief description of the sites. This table is reproduced from Kari and Fall (2003), and Dena'ina place names are given and punctuated using the Dena'ina alphabet. Table I-2 lists prehistoric cultural resources sites, and Table I-3 lists historic cultural resources sites.

**Table I-1**  
**Dena'ina Place Names in the Study Area<sup>a</sup> (page 1 of 5)**

<b>Dena'ina Place Name #</b>	<b>Dena'ina Name</b>	<b>English Translation</b>	<b>Site Description</b>
2.13	Q'ebengga Betnu	Creek of Little Lake on the Flat	Swamp and small stream into the Susitna [River]
2.14	Q'ebengga	Little Lake on (Flat)	Lake 1 mile south of Susitna Station
2.24	Q'eghtsigga	Little Slough	Island 1 mile south of Susitna Station
2.32	Qahnigi T'el'ihntnu	Rocks Are Gathered-Creek	Slough on east bank above Susitna Station
2.33	Ken Tiditunt	Where trail comes to the Flat	Swamp northeast of Susitna Station
2.42	Ken Tidituntnu	Trail comes up to the Flat-stream	Creek through swamp northeast of Susitna Station
3.1	Ggisgaht'ihntnu	Iron Pyrite Creek	Lower Fish Creek, southernmost outlet of Flat Horn Lake, locally "Cheechako Gold Creek"
3.2	Bek'dilyashi Betnu	Creek of Things Are Carried to It	Outlet of Flat Horn Lake, north of lower Fish Creek
3.3	Bek'dilyashi Bena	Lake of Things Are Carried to It	Flat Horn Lake
3.4	Shq'ach'egh Kena	Shortcut Flat	Large flat between Flat Horn Lake and Susitna Station
3.5	Gega Bena Betnu	Berry Lake Creek	Stream into north end of Flat Horn Lake
3.6	Gega Bena	Berry Lake	Lake 2 miles east of Susitna Station
3.7	Nqadink'et'i	Foot Path Extends	Low ridge from Flat Horn Lake to Cow Lake and to Susitna Station
3.8	K'ta'atnu	Soup Creek	Creek into northeast end of Flat Horn Lake
3.9	K'ta'atnu TI'u	Soup Creek Headwaters	Upper Soup Creek
3.10	Nuk'dalyut	Where a Bridge Extends Across	Bridge across upper Soup Creek
3.11	Tantun Betnu, Tantuntnu	Creek of Enclosed Object [bag] Is Set in Water	Middle Fish Creek, from Flat Horn Lake to Red Shirt Lake
3.12	K'enuq' Q'estsiq'	Mineral Lick Outlet	Creek (or former creek) into Fish Creek from 'Mineral Lick Lake' or Out Lake
3.13	K'enuq' Bena	Mineral Lick Lake	Two lakes 3 miles west of Red Shirt Lake outlet, now known as Out Lake

**Table I-1**  
**Dena'ina Place Names in the Study Area<sup>a</sup> (page 2 of 5)**

<b>Dena'ina Place Name #</b>	<b>Dena'ina Name</b>	<b>English Translation</b>	<b>Site Description</b>
3.14	K'enuq' Qiy'unt	Where There Is a Mineral Lick	Campsite by Out Lake
3.15	Tl'eghes Bena Q'estsiq'	Leech Lake Outlet	Cow Lake outlet stream
3.16	Tl'eghes Bena	Leech Lake	Cow Lake
3.17	Tl'eghes Bena Bidiituni	That Which Is Connected to Leech Lake	Small lake southeast of Cow Lake
3.18	Tanltunt	Where Enclosed Object [bag] Is Set in Water	Red Shirt Lake outlet village site
3.19	Tanltunt Bena	Enclosed Object [bag] Is Set in Water	Red Shirt Lake
3.20	Beq'estsiq' Tuyu'uli	Object Floating at the Outlet	Island at Red Shirt Lake outlet
3.21	Tanltun Tesha	Hill of Enclosed Object [bag] Is Set in Water	Ridge on west shore of Red Shirt Lake
3.22	Dach'qelqiht	Where We Spend the Spring	Site where Lynx Creek enters Red Shirt Lake
3.23	Nich'ghilentu	Creek That Flows Swiftly	Lynx Creek
3.24	Nich'ghilen Bena	Lake of Creek That Flows Swiftly	Lynx Lake
3.25	Tanltun Dintlent	Where It Flows into Enclosed Object [bag] Is Set in Water	Site at north end of Red Shirt Lake where upper Fish Creek enters lake
3.26	Tudli Benach' Titaytuntu	Creek on Trail to Cold Water Lake	Upper Fish Creek, above Red Shirt Lake
3.27	Bek'dilyashi Dintlent	Where it Flows into Things Are Carried to It	Stream into Flat Horn Lake from northeast
3.28	Tanltun Kaq'	Mouth of Enclosed Object [bag] Is Set in Water	Mouth of Fish Creek, on Flat Horn Lake
3.29	Nqadink'et'i Betnu	Foot Path Extends	Stream into lower Fish Creek
3.30	Tl'eghes Bena Q'estsiq' Hq'adghilent	Where Leech Lake Outlet Current Flows Down	Site where Cow Lake outlet stream meets Fish Creek
3.31	Hchil Nughik'at'	Weir Fence is Stretched Down	Weir site at Tanltunt
3.32	Łiq'a Hq'atnełt	Where Salmon Are Poured	Fish-holding pit on the bank at Tanltunt
3.33	Nik'uleht	Place that Fish Swim to	A sockeye spawning location along a gravel beach on upper Red Shirt Lake, possibly bay on northwest end of lake
8.2	Ch'atanaltsegh	Yellow Water Flows Out	Creek into Susitna River on east side 2 miles above the mouth of the Yentna, locally called "Shem Pete Slough"
8.6	Tutikaq'tnu	Creek of Descending Water Mouth	Rolly Creek
8.7	Tutikaq' Bena	Lake of Descending Water Mouth	North Rolly Lake
8.35	Niqaghelełt	Where Current Is Swirling	Bluff and eddy on the Susitna River, 1 mile above Dashq'e, on the east bank

**Table I-1**  
**Dena'ina Place Names in the Study Area<sup>a</sup> (page 3 of 5)**

<b>Dena'ina Place Name #</b>	<b>Dena'ina Name</b>	<b>English Translation</b>	<b>Site Description</b>
12.1	Tsaltastnu Kaq'	-?- River Mouth	Dena'ina women used to snare geese here
12.2	Tsaltastnu	-?- Stream	The Little Susitna River; fishing/trapping area used by people who lived at Red Shirt Lake
12.3	(no recorded name)		Maguire Creek; trail to Flat Horn Lake along this creek
12.4	Dusgeda Tukda Ti'iltant	Where Father of Dusgeda Was Carried Out	Shem Pete reports there was once a village here (Kari and Fall, 2003). The name refers to Chief Dusgeda Tukda dying here and being carried out of the bathhouse.
12.5	Sheshnena	Saving Land, "Rescue Land", "Lucky Land"	Low ridge extending from Cow Lake south to the Little Susitna River. Area used to gather canoe birchbark.
12.6	Unqeghnit Skitnu Bena	Upstream Brushy Stream Lake	Butterfly Lake. Tent camp area used for beaver hunting.
12.7	Delindin Bena	Derenty's Lake	Delyndia Lake
12.8	Utiditin	Trail Goes to It	Swamp between the Little Susitna River and Nancy Lake
12.9	Tudli Betnu	Cold Water Creek	Lake Creek; house pits are reported on the right bank (Reger, 1983 <sup>b</sup> ).
12.12	Tudli Bena	Cold Water Lake	Nancy Lake
12.13	K'itudaghi'ut	Where Water Extends in (to Land)	Indian Bay, "Indian Cove," middle bay on the east side of Nancy Lake. Village used for hunting, fishing and putting up fish.
12.23	Skitnu	Brushy Stream	Skeetna Lake outlet stream
12.24	Skitnu Bena, Unqeghdut Skitnu Bena	Upstream Brushy Stream Lake	Skeetna Lake
13.1	K'enaka Nen	-?- Land	Knik-Big Lake area
13.3	Dilhi Tunch'del'usht Beydegh	Point Where We Transport Hooligans	Fish camp/hooligan harvest site at Point MacKenzie
13.6	K'teleh Bena	Fish Run Lake	Lost Lake
13.7	Hnihighil'iy	Tooth that is embedded	Hill on south side of Goose Bay
13.9	Tustl'aghtnu	Rear Portage Creek	South fork of Goose Creek; set of trails and portages from Goose Bay north to Red Shirt Lake, passing Sevenmile Lake, Big Lake, Papoose Twin Lake, and the Little Susitna River
13.10	Łeyestnu	Dwarf Birch Creek	Goose Creek
13.11	Biłni Dnaghelggey Bena	White Water Lake	Sevenmile Lake
13.12	Łeyes Bena	Dwarf Birch Lake	Stephan Lake - may have been nichil [multi-family dwelling] there

**Table I-1**  
**Dena'ina Place Names in the Study Area<sup>a</sup> (page 4 of 5)**

<b>Dena'ina Place Name #</b>	<b>Dena'ina Name</b>	<b>English Translation</b>	<b>Site Description</b>
13.13	Elnen Ghilget	Rotten Ground	Swamp on Goose Bay side of Mosquito Point
13.14	Ts'es l'unt	Where There Is a Rock	A village at Mosquito Point between Fish Creek and Goose Bay when the army "took over".
13.15	K'enakatnu, C'enacetna'	-?- River	Major village site on a low terrace on the north bank of Fish Creek, approximately 0.1 mile above the mouth
13.16	K'eyghashtnu	Fish Harvest Creek	Channel in Knik Arm tide flat paralleling the bank between mouth of Fish Creek past Soldiers Creek to Knik Lake outlet
13.17	Nilq'adaydleni Betnu	Joining Streams Creek	Threemile Creek
13.18	K'enaka Bena	-?- Lake	Trail from Big Lake to Susitna Station (nichil at outlet) and to Red Shirt Lake
13.19	Nuqiltin Betnu	They Found a Place Creek	Outlet stream of West Papoose Twin Lake and stream from Hourglass Lake in the Little Susitna Drainage
13.20	Nuqiltin Bena	They Found a Place Lake	West Papoose Twin Lake; reported trail and nichil
13.21	Tutik'eltuni Betnu	Creek of ponds extend down	Lucile Creek; location for fish traps for trout and salmon
13.22	Tunilch'eli Bena	Clear Water Lake	Clear or Wallace lakes
13.23	Hey Gega Bena	Lowbush Cranberry Lake	Jacobsen Lake, west of Lake Lucile
13.24	Benkda	No-Good Lake	Lake Lucile; fishing location and trail
13.25	Hnits'uk'nilut, Hnits'uk'nilut Bena	Where Dishes Are Embedded, "Where Dishes Are Embedded Lake"	Caves Lake
13.26	Tuq'ets'ghet	By Spring Water	Susitna people used to live at this site located 1 mile below Knik (Kari and Fall, 2003)
13.27	Ch'ak'nileght	Where fish swim out	Mouth of Soldiers Creek, 2 miles south of Knik
13.28	Ggih Qughijaq Bena	Lake Where a Monster Came Up	White Lake
13.29	Nughay Bena	Frog Lake	Knik Lake, Knik townsite, "New Knik"
13.30	Kidaghi'i, Nlikidaghel'uyi	The Ones That Are Connected Together	First overflow marsh below Knik Lake - fishing place with nichil
13.31	Bekidaghi'uyi Gga	Little One That Is Connected to the End	Second lower salt marsh to the east of Knik Lake
13.46	K'telehtnu	Fish Run Stream	Mule Creek

**Table I-1**  
**Dena'ina Place Names in the Study Area<sup>a</sup> (page 5 of 5)**

<b>Dena'ina Place Name #</b>	<b>Dena'ina Name</b>	<b>English Translation</b>	<b>Site Description</b>
13.47	K'enakatnu Kaq'	-?- River-Mouth	Mouth of Fish Creek
13.48	Niŋq'adaydleni Bena	Joining Streams Lake	Hunting and berry-picking trail between Threemile and Sevenmile lakes (approximately 0.1 mile from Knik).
13.49	Nuqenduggesh	Lightning Strikes	Hill off Meadow Creek near the Theodore homestead
13.50	Ch'ak'nileghtnu	Fish Swim Out-Stream	Soldiers Creek, White Lake outlet Stream, 2 miles south of Knik

<sup>a</sup> Reproduced from Kari and Fall (2003); Dena'ina place names are punctuated according to the Dena'ina alphabet

<sup>b</sup> Not a primary reference in this appendix; Kari and Fall (2003) referenced this source, and SEA has retained it here to maintain continuity of the information.

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 1 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>i</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
ANC-00119	Previously documented	Lake Creek #1 (Tudli Bena)	Fifteen depressions in two areas. Eight are on a spruce-covered rise, 2 to 3 meters high adjacent to the lake. These are squared to rounded and range from 2 meters square to 3.7 meters in diameter, with depths to about 1.2 meters below surface. Seven are along the lower areas of the rise on the west side of the creek. All of these depressions are about 1 meter in diameter. Wood frame buildings of recent construction or under construction are present on the rise adjacent to the larger depressions. Minor disturbance of some of the pits was noted. According to Fall, Shem Pete recalled hearing about "a big nichil" [winter house] and fish traps at this location.	Prehistoric	NDE
ANC-00245	Previously documented	Lake Creek #2	Several cache pits were noted here on the terrace above the creek mouth. Testing did not reveal any subsurface remains.	Prehistoric	NDE
ANC-00608	Previously documented	Fish Creek Bend Site 4	The site consists of a cluster of six circular depressions that vary in size from 0.4 meter to 1.3 meters in diameter and 0.15 meter to 0.42 meter in depth. These depressions are approximately 0.1 meter to 0.6 meter apart at the base of a long, narrow ridge that parallels the east bank of Fish Creek.	Prehistoric	NDE

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension**  
**Project Area<sup>a</sup> (page 2 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
ANC-00614	Previously documented	Threemile Creek Confluence North 2	This site consists of approximately 25 small, circular depressions, measuring 0.8 to 1.5 meters in diameter, and three larger pits, measuring 1.5 to 2 meters in diameter and 0.4 to 0.5 meter deep, on two terraces paralleling Fish Creek and covering an area of approximately 30 meters. This area also appears to be a small camping spot and canoe landing site.	Prehistoric	NDE
ANC-00615	Previously documented	Threemile Creek Confluence North 3	The site consists of three possible structural depressions. The largest measures 8 by 10 meters and the two smaller ones measure 8 by 8 meters. The depressions appear to have similar orientations, but their outlines are very vague.	Prehistoric	NDE
ANC-00616	Previously documented	Threemile Creek Confluence North 1	This site consists of a 3-by-2-meter depression near the confluence of Threemile Creek with Fish Creek (near the Iditarod Trail).	Prehistoric	NDE
ANC-00619	Previously documented	Fish Creek Tributary Site	This site consists of approximately 30 small circular depressions on the west bank of Fish Creek, across from the confluence of an unnamed stream. The site area covers <1 acre on a slight terrace adjacent to Fish Creek. Dimensions of the depressions are unknown due to heavy snowfall at the time of the survey.	Prehistoric	NDE
ANC-00620	Previously documented	Liten Lake Area Site	This site consists of five separate groups of depressions on a promontory jutting into the Fish Creek-Threemile Creek swamp. Some pits are multi-cellular; one cluster consists of a linear series of six (1.5-by-2-meters square) pits. Thirty-four pits were discovered over the entire area, 19 of them measuring 1 to 2.5 meters in size. The remainder are small and circular with a diameter of less than 1 meter.	Prehistoric	NDE
ANC-00621	Previously documented	Victor Homesite Depressions	This site consists of a linear series of approximately four depressions extending for an estimated 12.6 meters along a northeast-trending ridge overlooking a small tributary of Fish Creek. Dimensions were estimated due to heavy snowfall at the time of the survey.	Prehistoric	NDE

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 3 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
ANC-00624	Previously documented	Fish Creek Bend 1 Site	This site consists of a series of five depressions ranging in size from 0.55 by 0.6 meter to 1.49 by 3.34 meters, covering a 10-square-meter area. Seismic lines run along the southeast and northwest sides of the site.	Prehistoric	NDE
ANC-00625	Previously documented	Fish Creek Bend 2 Site	This site consists of a total of eight depressions in three clusters. Two of the clusters have two large pits; the third is a series of four pits in a T-shaped configuration. These depressions range in size from 1 by 1 meter to 2 by 2.5 meters.	Prehistoric	NDE
ANC-02870	Previously documented	Nancy Lake Caches	The site [has] three cache pits, numerous culturally modified trees (blazed, bark stripped, one twisted).	Prehistoric	NDE
ANC-02988	Yes		One surface depression (2.4 by 1.8 by 0.6 meters) on a southwest slope nestled in a thicket of baneberries. The bench above is very rumpled with several untested cache-like features.	Prehistoric	NDE
ANC-02989	Yes		One surface depression (2.4 by 1.4 by 0.5 meters) in the bottom of a swale. The pit has straight sides that are thickly moss-covered. Though about 70 meters from ANC-02988, they are likely associated.	Prehistoric	NDE
ANC-02992	Yes		One surface depression (1.5 by 2.5 by 0.25 meters) along a ridgeline with high grass in mature deciduous hardwood forest on well-drained upland. Excellent hunting area overlooking wetlands down steep slope to east and easier slope to west. Numerous trails cross open forest.	Prehistoric	NDE
ANC-02993	Yes		This site consists of four surface depressions. Two adjacent depressions, possibly cache pits, have dimensions of 2.0 by 1.9 by 0.8 meters and 1.9 by 1.9 by 0.6 meters. The other two surface depressions (2.0 by 2.0 by 0.8 meters) are on a ridge/draw complex overlooking a low wet black spruce bog with mossy floor to the east and north.	Prehistoric	NDE

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 4 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
ANC-02994	Yes	PMREP	Cluster of three house depressions (3.5 by 3.2 by 0.5 meters, 3.0 by 2.8 by 0.7 meters, and 3.0 by 3.0 by 0.5 meters) with at least 65 smaller surface depressions (likely cache pits) nearby. Both rectangular houses have Arctic entries, with one opening to the northeast and the other to the southeast. The one to the northeast has what appears to be a cooking pit beside the doorway. A fourth smaller house depression (2.5 by 1.8 by 0.4 meters) is set 30 meters away. One house depression is filled with alder and has mossy ground cover; the others are in grassy areas. There are four distinct riffles (elevation drops) in the creek frontage that could be fish weir remains. Several large boulders in the stream next to some riffles might have been part of a weir or trap system. The water is approximately 1 foot deep in general, with areas of deeper channel scour and bank undercutting on the opposite side from the site. There is a series of four adjacent cache pits each about 1.0 meter in diameter and all less than 0.6 meter deep along the trail on the first terrace by the creek. About 50 meters southeast of these there are two more adjacent cache pits (each 0.5 by 0.5 by 0.7 meters). One of these contains the remains of a wood post and other structural materials. There are at least two tree blazes along the creek, and several culturally modified trees in the vicinity, including stumps of trees cut with an axe, adze, or hand saw. There is a cubby-style snare set at the northwestern extent of the site on the flat, but this is likely modern. The entire site stretches along Fish Creek near the intersection with Three Mile Creek on a bench or floodplain, with the house-sized depressions on benches approximately 10 feet higher than the floodplain. The area is covered in mixed deciduous and white spruce hardwood forest of a mature character with many tree falls. Farther east there is higher-density black spruce bog adjacent to the streams.	Prehistoric	NDE



**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension**  
**Project Area<sup>a</sup> (page 5 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
ANC-02995	Yes		Rectangular surface depression (3.0 by 3.0 by 1.5 meters), likely a house feature, on a southeast bench of hill X78, south of Bolo Lake, overlooking a 2-meter-tall bluff face leading down to a wetland area with a stream feeding easterly and likely into the Fish Creek watershed. Site overlooks a wide open space that is typical of successful moose hunting areas. The depression is situated in the burnt-out remains of a forest fire in what was mixed deciduous and white spruce forest. There is an animal den in the corner of the pit. No cache pits were identified nearby; however, the area is difficult to see due to the number of fallen burnt trees.	Prehistoric	NDE
ANC-02996	Yes		A surface depression (3.0 by 5.0 by 0.75 meters), likely a house feature, with several smaller depressions, possibly cache pits, were located at the base of the floodplain of Little Meadow Creek in a patch of mature spruce trees. On top of the river bank the trees have all been knocked down, probably by forest fires. Cache pits are 1.0 by 2.0 by 0.5 meters arranged in a line along the bank, with the house feature cut slightly into the bank with a tall berm on the floodplain side.	Prehistoric	NDE
ANC-02997	Yes		This site consists of five small surface depressions on uplands above Little Meadow Creek. Each depression is about 2 meters squared in a line along the contour line of a slight ridge. These are likely cache pits for salmon from Little Meadow Creek. The pits are near a power line corridor and a 1915 General Land Office brass cap marker.	Prehistoric	NDE
TYO-00014	Previously documented	TYO-00014	About 10 to 15 cache pits, and one possible house pit, are reportedly located on a small hill on the south side of Willow Creek.	Prehistoric	NDE
TYO-00035	Previously documented	Horseshoe Lake Caches	Five cache pits, measuring 1.5 meters in diameter and 1 meter deep, were located on a terrace about 3 meters above the level of the lake.	Prehistoric	NDE

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension**  
**Project Area<sup>a</sup> (page 6 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
TYO-00041	Previously documented	TYO-00041	Reger and Dixon <sup>e</sup> reported two double-celled depressions (each pit measuring 2.5 by 3.0 meters), three 1.5-meter diameter depressions (arranged in a row, each about 2 meters apart), and five depressions (about 1 meter in diameter and clustered within a 5-meter-by-4-meter area, with a faint outline of a rectangular depression attached to one side) on the edge of a terrace overlooking a former lake or river bed. All depressions, except the rectangular outline, were about 70 centimeters deep.	Prehistoric	NDE
TYO-00060	Previously documented	TYO-00060	Yarborough <sup>e</sup> noted one small and two large cache pits on a point of land approximately 1.5 kilometers southeast of the confluence of Willow Creek with Susitna River. The features measure 0.9 by 1.4 meters and 0.4 meter deep, 3.4 by 2.9 meters and 0.85 meter deep, and 2.65 by 2.6 meters and 0.6 meter deep. Two tests were made. Southeast of these, Lee and Seager-Boss <sup>e</sup> reported finding 10 additional depressions in four locations. The depressions range from 1 meter square to 3 to 4 meters square.	Prehistoric	NDE
TYO-00067	Previously documented	TYO-00067	A deep rectangular feature (2.8 by 2.8 by 1 meters), probably a cache pit, on a well-drained terrace about 480 meters east of the Little Susitna River and about 140 meters south of TYO-068. A birch tree was noted growing in the adjacent backfill. A total of 17 tests placed within 10 meters of the pit failed to produce cultural material. A recent camp (consisting of a dead fire filled with fresh fish heads and skeletons and covered with branches) and a tree cache were also noted about 100 meters to the west, on the same terrace.	Prehistoric	NDE
TYO-00068	Previously documented	TYO-00068	A 2.2-by 1.7-by-1-meter feature, probably a cache pit, on a well-drained terrace about 380 meters east of the Little Susitna River and about 140 meters north of TYO-00067. A total of 16 tests placed within 10 meters of the pit failed to produce cultural material.	Prehistoric	NDE

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension**  
**Project Area<sup>a</sup> (page 7 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
TYO-00136	Previously documented	TYO-00136	The site consists of two caches, one with charcoal in the test. Surface and subsurface scatter of stone basalt tools (6) and flakes (12), and a massive triangular core (70 centimeters long, 45 centimeters wide, and 10 centimeters thick) was found under 14-inch diameter spruce, because the roots are bringing artifacts to the surface. There is also a blazed tree at the site.	Prehistoric	NDE
TYO-00137	Previously documented	TYO-00137	Trappers' shelter (3.3 meters by 1.9 meters by 60 centimeters with birch bark under the organics.	Prehistoric	NDE
TYO-00138	Previously documented	TYO-00138	Angular stone tools and flakes in a brown soil matrix. Artifacts coming from 30 centimeters below surface with burnt soil, discoloration, ash, and charcoal.	Prehistoric	NDE
TYO-00141	Previously documented	TYO-00141	A hunter or trapper shelter, 1.5 by 1.5 meters a 60-by-60-centimeter entry to the northwest. Depth is 20 to 40 centimeters.	Prehistoric	NDE
TYO-00142	Previously documented	Vicki Cole Using <sup>d</sup>			NDE
TYO-00143	Previously documented	Vicki Cole Using <sup>d</sup>			NDE
TYO-00144	Previously documented	Vicki Cole Using <sup>d</sup>			NDE
TYO-00145	Previously documented	Dan Stone Using <sup>d</sup>			NDE
TYO-00146	Previously documented	Dan Stone Using <sup>d</sup>			NDE
TYO-00163	Yes		One rectangular surface depression (2.4 by 3.0 by 0.3 meters) on a small ridge associated with the Elmendorf Moraine. No mature growth in depression might indicate it is a relatively recent feature.	Prehistoric	NDE
TYO-00165	Yes		One round surface depression (1.8 by 1.8 by 0.3 meters) on small ridge less than 0.5 mile west of Goose Creek flats. No mature growth in depression might indicate it is a relatively recent feature.	Prehistoric	NDE

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension**  
**Project Area<sup>a</sup> (page 8 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
TYO-00166	Yes		One small rectangular surface depression (1.5 by 2.5 by 0.3 meters), possibly a temporary Dena'ina trail shelter, in well-drained upland, mature mixed hardwood forest area,. Feature does not appear to be a root cast or other naturally caused depression. Test pit indicated no cultural deposits or stratigraphic disconformities.	Prehistoric	NDE
TYO-00167	Yes		One surface depression (2.0 by 2.5 by 0.25 meters) in mature hardwood forest in well-drained upland soils; however, vicinity of feature is a small patch of spruces with rectangular berm and moss instead of prevalent Labrador tea forest floor groundcover. Feature is near dozer and other trails through forest and not far from a former kettle/kettle lake, 0.15 mile to the northeast. The location is possibly the former site of a small structure or cache.	Prehistoric	NDE
TYO-00168	Yes		A line of three surface depressions approximately 1-meter square in a mature, well-drained upland hardwood forest with Labrador tea and grass understory. Feature is not far from kettle depressions and bluff edge above Goose Bay flats.	Prehistoric	NDE
TYO-00169	Yes		One small surface depression, possibly a overnight shelter ( <i>titenq'a</i> ), on top a small knob overlooking a lake.	Prehistoric	NDE
TYO-00171	Yes		This site consists of eight 1-meter square surface depressions. This group of depressions is in a patch of alders along a ridge slope overlooking a wide area of shallower sloping mature hardwood forest. Surface depressions are on the steepest part of the hill slope. Area is noted for hosting a relatively dense population of Dena'ina people of the Sushetna division. Surface depressions are west of Cow Lake on the west side of a ridge used as a trail to nearby Red Shirt Lake.	Prehistoric	NDE
TYO-00172	Yes		One surface depression (1.0 by 1.2 by 0.3 meters).	Prehistoric	NDE

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension**  
**Project Area<sup>a</sup> (page 9 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
TYO-00173	Yes		One surface depression (2.0 by 2.0 by 0.4 meters) with four or more smaller, 1-meter square surface depressions in the vicinity. Located in mature upland deciduous forest in well-drained area heavily covered with Devil's Club. Located on the west slope of a ridge about 0.6 mile from Cow Lake used by Dena'ina as trail connecting Red Shirt Lake to the coast.	Prehistoric	NDE
TYO-00175	Yes		A series of surface depressions at the base of a ridge to the west of Red Shirt Lake and 0.15 mile north of the Fish Creek outlet of Red Shirt Lake. There is a larger surface depression is at the top of the ridge line. The larger depression is indistinct but approximately 2.0 by 3.5 by 0.5 meters with a berm around three sides. View is excellent from the top over the lowlands below, and the small surface depressions are probably local cache pits for abundant food resources from wetlands to the west and Fish Creek to the south. Small depression in deciduous forest patch at base of bluff with mossy ground cover, while uplands consist of Devil's Club in a mature deciduous hardwood forest with tall grass.	Prehistoric	NDE
TYO-00176	Yes		Three surface depressions (1.0 by 1.0 by 0.5 meters each) and one small surface depression (1.0 by 0.5 by 0.2 meters) in mossy black spruce forest above water-saturated peat wetlands west of the Red Shirt Lake ridge and north of Fish Creek. These depressions are possibly storage or cache pits and are at 200 feet elevation.	Prehistoric	NDE
TYO-00177	Yes		One surface depression (1.0 by 1.0 by 0.5 meters).	Prehistoric	NDE
TYO-00178	Yes		One surface depression 2.0 by 3.0 by 0.25 meters) with a very shallow slope and small berm in mature upland hardwood forest along well-drained ridge complex. Near upland lakes 0.2 mile south and 0.35 mile west-southwest. A nearby open space might be a spring or seasonal wetland. There might be other depressions nearby, but these are relatively indistinct.	Prehistoric	NDE

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension**  
**Project Area<sup>a</sup> (page 10 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
TYO-00179	Yes		One surface depression (2.0 by 3.0 by 1.5 meters) surrounded by a 1-foot-high berm and its long axis oriented north-south on the west side of a ridge west of Red Shirt Lake. The depression is less than 0.1 mile from a spring indicated on the U.S. Geological Survey map in a well-drained, relatively flat area overlooking a steep drop of wetlands. There is a second, smaller (0.6 by 0.6 by 0.5 meter), surface depression nearby. Mature mixed deciduous and white spruce hardwood forest cover the immediate area. This feature might be a single-room house pit with cache pits nearby.	Prehistoric	NDE
TYO-00180	Yes		One surface depression (2.0 by 1.5 by 0.5 meters), possibly an overnight shelter ( <i>titenq'a</i> ), on the tip of a point into a paleolake (now a swamp). There is one Culturally Modified Tree (CMT) adjacent to it that has two blazes, one above the other, on each opposite side of the tree (four total blazes).	Prehistoric	NDE
TYO-00181	Yes		Large house depression (9.0 by 8.5 by 0.8 meters) with Arctic entry (1.1 by 1.1 meters) opening to S70°W. There is a cooking pit in the south corner and a central hearth. The house is 10 meters in from a steep 30-meter high bluff. There are no cache pits associated with this feature.	Prehistoric	NDE
TYO-00182	Yes		One rectangular surface depression (2.0 by 1.0 by 0.5 meters), possibly a cache pit.	Prehistoric	NDE
TYO-00183	Yes		One rectangular surface depression (1.0 by 0.5 by 0.5 meters), possibly a cache pit.	Prehistoric	NDE
TYO-00185	Yes		This site consists of a single house depression (3.2 by 3.0 by 1.2 meters). A test in the depression recovered a stone artifact. There is a steep south-facing nose 15 meters south. The field crew dug a number of tests around the house depression and on top of the overlook. One test pit revealed a brown chert flake at 25 centimeters below surface and a grey chert flake at 45 centimeters below surface, possible tablet core at 45 centimeters below surface, and charcoal from 16-40 centimeters below surface.	Prehistoric	NDE

**Table I-2**  
**Prehistoric Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension**  
**Project Area<sup>a</sup> (page 11 of 11)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>f</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
TYO-00187	Yes		One surface depression (4.5 by 3.5 by 1 meters) in a mature hardwood forest. Depression is located along a bluff edge on which other house pits and cache pits were discovered to the NE and SW of this feature.	Prehistoric	NDE
TYO-00188	Yes		Complex of at least 17 surface depressions. Three 2 by 2 by 1 meters, one 1 meter in diameter, two 2.0 by 2.0 by 0.5 meters, a five-cell vertical row (oriented S10°E), and a six-cell set of depressions. The six-cell is 4 meters in from the bluff edge and measures 7.5 by 6.5 meters; the cells range from 0.8 to 1.1 meters deep. Several CMTs along the bluff edge mark the site and the trail leading both to the northeast (down the bluff) and to the southwest (along the bluff edge toward the house pit at TYO-00187).	Prehistoric	NDE
TYO-00189	Yes		One surface depression (1 by 2 by 1 meters), possibly a cache pit.	Prehistoric	NDE

<sup>a</sup> Sources : ADNR, 2008; Stephen R. Braund & Associates, 2009.  
<sup>b</sup> To convert meters to feet, multiply by 3.2808; to convert centimeters to inches, multiply by 0.3937; to convert kilometers to miles, multiply by 0.62137/  
<sup>c</sup> NDE = a determination of eligibility for inclusion on the National Register has not been made; NRE = determined to be eligible for inclusion on the National Register; NRJ = National Register nomination rejected.  
<sup>d</sup> These are archaeologists who have documented cultural resources and requested an AHRs number from the Office of History and Archaeology. However, at the time analysts requested the AHRs data for use in the proposed Port MacKenzie Rail Extension Environmental Impact Statement analysis of potential impacts to cultural resources, these archaeologists had not yet submitted their site descriptions to the Office of History and Archaeology.  
<sup>e</sup> Not a primary reference in this appendix; the Alaska Heritage Resources Survey database on file with the Alaska Department of Natural Resources references this source, and SEA has retained it here to maintain continuity of the information.  
<sup>f</sup> 2008 cultural resources survey conducted by SEA.

**Table I-3**  
**Historic Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 1 of 6)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>e</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
ANC-00085	Previously documented	The Little Susitna River Railroad Bridge (The Little Susitna River)	This is a railroad bridge that consists of one 80-foot' through-girder fabricated by the American Bridge Company and mounted on concrete abutments in 1927. It was made of steel stringers and 70-pound rail guards. The north pier was washed out in 1943. [This is incorrectly designated ANC-063 in Brown 1975 <sup>d</sup> .]	Historic (AD 1927-1943)	NDE
ANC-00086	Previously documented	Houston Railroad Station	This is the site of a former railroad station that was established in 1917 near several important coal mines that were being developed. It was named after Congressman Houston of Tennessee. A spur was constructed from here to the Jandos and Athans coal mines in early 1918. [This is incorrectly designated ANC-064 in Brown 1975 <sup>d</sup> .]	Historic (AD 1917)	NDE
ANC-00470	Previously documented	Nancy Roadhouse	Roadhouse located southwest of Nancy railroad "station," which Smith (1974) <sup>d</sup> refers to as Nancy Roadhouse because of its proximity to Nancy railroad station and Nancy Lake. [Incorrectly assigned ANC-052 in Smith, M.E. 1974 <sup>d</sup> .]	Historic	NDE
ANC-00607	Previously documented	Fish Creek Bend Site 3	This site consists of milled, rotten, 2-inch-by-2-inch boards with round nails at the base of a large hill next to Fish Creek. The use of these boards is unknown.	Historic	NDE
ANC-00617	Previously documented	South Vance Road Site	This is a partially collapsed, rectangular log structure, measuring 10.13 by 5.69 meters, with no doors or windows (structure not completed). The walls are 12 logs high, with the base logs sitting on 12 concrete footings and having saddle-notched corners. The roof has collapsed, but there is no evidence of shingles or tarpaper. To the south of the building there is a large pile of debris that includes milled boards, pallets, lumber, and miscellaneous debris.	Historic	NDE



**Table I-3**  
**Historic Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 2 of 6)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>e</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
ANC-00618	Previously documented	Vance Road Site 1	This is a log structure, measuring 8.5 by 5.5 meters, with a partially collapsed roof, saddle-notched logs, and burlap chinking. The remaining walls of the structure are eight logs high (about 1.65 meters). There is a porch on the north and tongue-and-groove boards were used for the interior floor. To the east is a depression (garbage pit?) and to the west is an outhouse. To the southeast is a birch tree with ladder made of boards nailed to the tree. Miscellaneous "modern" debris is scattered around the site.	Historic	NDE
ANC-01341	Previously documented	Houston Mine	[No Site Description Available]		NDE
ANC-02777	Previously documented	(Alaska Railroad Corporation Bridge at Mile Post 180.8) Nancy Lake Overpass	Nancy Lake Overpass bridge is a 28-foot concrete ballast deck bridge consisting of one 28-foot concrete span. The bridge rests on steel pile bents with concrete caps. The bulkheads are driven steel sheet piles. This bridge has neither inner guardrails nor outer tie spacers. A fiber optic cable runs in the ballast across the bridge. The Alaska Engineering Commission built the original timber trestle bridge in 1917 from standard plans using local timber. The bridge consisted of six 14-foot spans and was originally numbered 60. The railroad rebuilt the bridge in 1935 and again in 1952 with untreated timber. A fourth stringer was added for the increased weight of diesel locomotives. Work performed since that time includes new caps (1972), new stringers, ties, and guardrails (1974), new floor (1975), new treated bulkheads (1982), and new steel tie spacers. In 2002, the Alaska Railroad Corporation replaced the timber bridge with the concrete ballast deck bridge to improve safety and reduce maintenance costs.	Historic (AD 1952)	NRJ
ANC-02990	Yes		Shooting blind with three notched log walls and metal chair on the square nose of an overlook ridge.	Historic	NDE

**Table I-3**  
**Historic Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 3 of 6)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>e</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
ANC-02991	Yes		Red painted 20-by-24-foot frame house with nearby outhouse. The house is accessed by a gravel road. While the house has not been used in some time it is obviously not abandoned. Age unknown, title to the land patented in 1965.	Historic	NDE
ANC-02998	Yes		1916 Post Office route from Knik to Susitna, connects to TYO-00164. The field crew crossed this feature during the field survey and assigned the feature a Global Positioning System waypoint. This waypoint intersected a route digitized from a 1916 Post Route Map of the Territory of Alaska.	Historic, 1916	NDE
TYO-00017	Previously documented	Little Susitna Roadhouse	Roadhouse on the Iditarod Trail, approximately 14 miles out of Knik. Also known as the Halfway Roadhouse, it was operated for many years by Lee and Grace Exelson after they left the Happy River Roadhouse (TYO-023). The structure has reportedly been washed away by the river.	Historic	NDE
TYO-00026	Previously documented	Willow Creek Railroad Bridge	Railroad bridge fabricated by American Bridge Company and erected during the construction of the Alaska Railroad. Two bents, concrete abutments, one 80-foot span, deck girders, concrete caps in 1927; steel stringers. Steel construction.	Historic (AD 1927)	NDE
TYO-00027	Previously documented	Little Willow Creek Railroad Bridge	Railroad bridge fabricated by American Bridge Company and erected during the construction of the Alaska Railroad. Two bents, concrete abutments, one 80-foot span, deck girder, concrete caps in 1926; steel stringers, new ties and guard rail in 1961.	Historic (AD 1926)	NDE
TYO-00034	Previously documented	Fish Creek 2	A small area with one cache pit, which yielded one cut bone and historic ceramic fragments, was reported as an aboriginal village site on the Susitna River to Nancy Lake trail.	Historic	NDE

**Table I-3**  
**Historic Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 4 of 6)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>e</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
TYO-00038	Previously documented	William Davis Homesite (Johnson Homestead, Little Willow Homesite)	This homestead, patented by Aura and R. L. Johnson as a 5-acre homesite in 1954 and a 159-acre homestead in 1956, includes a cabin built in 1914-1915 by William Davis, a trapper and mink-farm operator. This cabin is purported to be the oldest continuously used building along the railroad from Seward to Fairbanks. During construction of the Alaska Railroad, a log barn housed the railroad's horses and mules.	Historic (AD 1916)	NDE
TYO-00084	Previously documented	Knik-Rainy Pass Trail (INHT-PT)	The Knik-Rainy Pass Trail is a segment of the primary Iditarod Trail historic route. The trail in this quadrant begins 0.25 mile northeast of Jewel Lake, runs northwest crossing Susitna River, Alexander Creek, and Skwentna River, passing Shell Lake, Finger Lake and crosses Happy River. (Other trail segment is ANC-761.)	Historic (early AD 1900s)	NDE
TYO-00096	Previously documented	Alaska Railroad Mile Post 187.7 Iron Creek Bridge (Willow Creek Bridge)	The original structure, a 75-foot-long, five-span timber trestle, was built in 1917. A sixth span was added in the 1940s. The current span is 84 feet long, 10 feet wide at the ties, and about 12 feet above the creek bed. It is primarily supported by creosoted timber piles driven into the creek bed. The piles are arranged in seven rows of five piles each, perpendicular to the tracks. Each row is capped by a beam and diagonally braced on both sides, forming structural bents. The outer piles in each bent are sloped to increase lateral stability. At each end of the bridge, an abutment of horizontal timbers retains the soil adjacent to the first bent. Two composite beams, each made up of four rows of beams through-bolted together, rest on the bents and support evenly spaced ties. Plywood laid between the tracks in the 1990s provides moose running down the tracks in front of a train a better surface for crossing the bridge. In 1950, treated pilings replaced the original untreated ones, caps and braces were replaced, and a stringer added to each chord. In 1971 bridge ties and guardrail were replaced.	Historic (AD 1917-1952)	NRE

**Table I-3**  
**Historic Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 5 of 6)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>e</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
TYO-00164	Yes		1916 Post Office route from Knik to Susitna, connects to ANC-02998. The field crew crossed this feature during the field survey and assigned the feature a Global Positioning System waypoint. This waypoint intersected a route digitized from a 1916 Post Route Map of the Territory of Alaska.	Historic, 1916	NDE
TYO-00170	Yes		Iron Dog Trail. The field crew crossed this feature during the field survey and assigned the feature a Global Positioning System waypoint. This waypoint intersected the Iron Dog Trail that SRB&A digitized from a Parks, Refuges, and Recognized Trails Map from the Port MacKenzie Rail Extension Project Preliminary Environmental and Alternatives Report. The Iron Dog Trail is part of the Iron Dog Race and portions of the trail occur along section lines which date back to the 1960s seismic testing programs or even earlier.	Historic	NDE
TYO-00174	Yes		Log cabin on ridge west of Cow Lake along a gravel airstrip. Old land-clearing tractor is next to cabin. Cabin shows evidence of recent repair activity to roof and the age of the cabin is unknown.	Historic	NDE
TYO-00184	Yes		Almond Lake Trail. The field crew crossed this feature during the field survey and assigned the feature a Global Positioning System waypoint. This waypoint intersected an SRB&A digitized trail feature called the Almond Lake Trail (see Matanuska-Susitna Borough Forest Management Plan Phase 1 – Part 2 document for map of trail). This trail is part of the West Gateway system near Willow. According to the Willow Area Trail Plan, the earliest trails within the West Gateway system were used for	Historic	NDE

**Table I-3**  
**Historic Alaska Heritage Resource Survey (AHRs) Sites in Port MacKenzie Rail Extension Project Area<sup>a</sup> (page 6 of 6)**

<b>AHRs No.</b>	<b>Documented During 2008 Survey<sup>e</sup></b>	<b>Site Name</b>	<b>Site Description<sup>b</sup></b>	<b>Period (Date)</b>	<b>National Register of Historic Places Status<sup>c</sup></b>
TYO-00184 (cont'd)			hauling freight to the Hatcher Pass mines and have been extended over the years by homesteaders, hunters, trappers, and dog sledgers in the area.		
<sup>a</sup> Data Sources : ADNIR, 2008; Stephen R. Braund & Associates, 2009. <sup>b</sup> To convert meters to feet, multiply by 3.2808; to convert centimeters to inches, multiply by 0.3937; to convert kilometers to miles, multiply by 0.62137 <sup>c</sup> NDE = a determination of eligibility for inclusion on the National Register has not been made; NRE = determined to be eligible for inclusion on the National Register; NRJ = National Register nomination rejected. <sup>d</sup> Not a primary reference in this appendix; the Alaska Heritage Resources Survey database on file with the Alaska Department of Natural Resources references this source, and SEA has retained it here to maintain continuity of the information <sup>e</sup> 2008 cultural resources survey conducted by SEA.					

## **I.1 References**

- ADNR (Alaska Department of Natural Resources), Office of History and Archaeology. 2008. 2008 Alaska Heritage Resources Survey. Anchorage, AK: Database on file with State Office of History and Archaeology.
- Braund, S. R., & Associates. 2009. Port MacKenzie Rail Extension Project Report of 2008 Cultural Resources Fieldwork.
- Kari, J., and J. A. Fall. 2003. Shem Pete's Alaska. The Territory of the Upper Cook Inlet Dena'ina. Second Edition. Shem Pete, Principal Contributor. Fairbanks, AK: University of Alaska Press.

**APPENDIX J**  
**DRAFT PROGRAMMATIC AGREEMENT**

**DRAFT PROGRAMMATIC AGREEMENT**

**Among**

**Surface Transportation Board,  
Advisory Council on Historic Preservation,  
Federal Railroad Administration, and  
Alaska State Historic Preservation Officer,**

**Regarding**

**The Alaska Railroad Corporation Construction and Operation of a Rail Line Extension to  
Port MacKenzie, Alaska**

**STB Finance Docket No. 35095**





## J.1 Draft Programmatic Agreement

**WHEREAS**, the Surface Transportation Board (STB)<sup>1</sup>, the lead Federal agency, has received an application from the Alaska Railroad Corporation (ARRC or applicant) to construct and operate approximately 30 to 45 miles of the proposed rail line to connect the Port MacKenzie District in Matanuska-Susitna Borough (MSB) to a point on the existing ARRC main line between Wasilla and north of Willow, Alaska (Undertaking); and,

**WHEREAS**, the STB has determined that the proposed project is an Undertaking subject to Section 106 of the National Historic Preservation Act, (Section 106) 16 U.S.C. 470(f), which may have an effect upon properties included in or eligible for inclusion in the National Register of Historic Places (NRHP), *i.e.*, “historic properties” as defined at 36 CFR 800.16 (l)(1), the full extent of which will not be known until after execution of this Agreement; and,

**WHEREAS**, the STB is in consultation with the Advisory Council on Historic Preservation (ACHP); Federal Railroad Administration (FRA); and the Alaska State Historic Preservation Officer (SHPO), pursuant to Section 800.14(b) of the regulations (36 CFR Part 800) implementing Section 106; and,

**WHEREAS**, the STB, ACHP, FRA, and the SHPO are Signatories pursuant to 36 CFR 800.6(c)(1) and have authority to execute, amend or terminate this Draft Programmatic Agreement (Agreement); and,

**WHEREAS**, the FRA is a Signatory because it may provide grant funding to ARRC for the Undertaking; and,

**WHEREAS**, the Knik Tribal Council is an Invited Signatory pursuant to 36 CFR 800.6(c)(2) because it attaches a religious and/or cultural significance to the Dena’ina cultural landscape that may be affected by the Undertaking and has the same authority to amend or terminate this Agreement as Signatories; and

**WHEREAS**, the ARRC is an Invited Signatory pursuant to 36 CFR 800.6(c)(2) and has the same authority to amend or terminate this Agreement as Signatories.

**WHEREAS**, the State of Alaska’s Department of Natural Resources (ADNR) is a Concurring Party pursuant to 36 CFR 800.6(c)(3) because it is a major land holder in the study area for some alternatives and if the STB licenses an alternative that crosses ADNR land, ADNR would need to grant right-of-ways associated with the Undertaking; and

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<sup>1</sup> The Surface Transportation Board (STB) was created with the passage of the ICC Termination Act of 1995 (Pub. L No. 104-88). The STB, an independent agency administratively housed within the U.S. Department of Transportation, is responsible for administering rail, pipeline, and certain adjudicatory functions involving motor and water carriers. These responsibilities are similar to those duties formerly administered by the Interstate Commerce Commission. The STB is the lead agency under the National Environmental Policy Act (NEPA) for the Port MacKenzie Rail Extension Project.

**WHEREAS**, the STB has consulted with and continues to consult with the Indian Tribes and Alaska native corporations (Tribes) listed in Attachment A of this Agreement who may attach a religious and/or cultural significance to properties that may be affected by the Undertaking and these Tribes have been invited to participate in this Agreement as Concurring Parties; and

**WHEREAS**, the Matanuska-Susitna Borough (MSB) is a Concurring Party pursuant to 36 CFR 800.6(c)(3) because it is a certified local government under the NHPA (16 U.S.C. 470a(c)) and therefore has the ability to manage its own historic properties; and

**WHEREAS**, the refusal of any party invited to concur with this Agreement does not invalidate the Agreement; and,

**WHEREAS**, the STB, in consultation with the SHPO, has established the Undertaking's Area of Potential Effects (APE), as defined at 36 CFR 800.16(d), as the following: The APE for direct effects would include the 200-foot-wide right-of-way as well as areas where the ground will be disturbed such as staging areas, work camps, cut and fill areas, material sources/gravel quarries, overburden disposal areas, associated buildings/structures (e.g., sidings, bridges, etc.) and associated infrastructure (e.g., communication towers, power lines, etc.). Indirect effects may include an APE larger than the 200-foot right-of-way, may include vibration, noise, and access to trails and traditional use areas, and are dependent on the frequency of railroad traffic and the sensitivity of the historic property. The APE for visual effects may extend beyond the 200 foot right-of-way, and is dependent on topography, vegetation and the built environment beyond the right-of-way, the visual sensitivity of the historic property, and whether that portion of the Undertaking would be constructed at-grade or above-grade; and,

**WHEREAS**, the STB, as lead Federal agency, in conjunction with the FRA the United States Army Corps of Engineers, Alaska District (USACE); and U.S. Coast Guard, Seventeenth Coast Guard District (USCG) (i.e., cooperating agencies) has prepared an Environmental Impact Statement (EIS) in accordance with the requirements of the National Environmental Policy Act (NEPA) to address the potential impacts of the Undertaking on a variety of human and natural resources; and,

**WHEREAS**, the STB, in consultation with the Signatories and Invited Signatories, developed a *Cultural Resources Work Plan: Proposed Port MacKenzie Rail Extensions Project, Port MacKenzie to Willow, Alaska STB Finance Docket No. 35095 (ID Plan)* for inventory of potentially-eligible historic properties prior to construction, and has conducted potentially-eligible historic properties inventories for a range of alternatives, which were subsequently narrowed down for inclusion in the EIS; and,

**WHEREAS**, the STB has made a reasonable and good faith effort to identify and evaluate historic properties within the APE for the purposes of comparing impacts in the EIS, including 59 prehistoric cultural resources, 23 historic cultural resources, the Dena'ina cultural landscape and the Iditarod National Historic Trail and Iditarod Race cultural landscape; and,

**WHEREAS**, the STB has deferred, until after the STB licenses an alternative, the final identification, evaluation, assessment of effect and consideration of alternatives to avoid,

minimize, or mitigate effects to historic properties that may be affected by this Undertaking, and the Signatories have agreed to develop this Agreement in accordance with 36 CFR 800.14(b)(1)(ii) to provide for the phased identification of historic properties and evaluate effects to historic properties caused by construction of the Undertaking that cannot be fully assessed at this time; and, .

**NOW, THEREFORE**, the Signatories and Invited Signatories to this Agreement consent that the proposed Undertaking shall be implemented in accordance with the following stipulations in order to consider the effect of the Undertaking on historic properties.

## **J.2 Stipulations**

The STB shall ensure that the following measures are carried out:

### **I. Administrative Considerations**

- A. The Signatories shall attach this Agreement or the measures (stipulations) called for in this Agreement to any Record(s) of Decision (ROD), approved permit(s), or other condition(s) issued for this Undertaking so that this Agreement and its requirements become legally enforceable and binding on those actions.
- B. This Agreement and all of its requirements shall be binding on ARRC, as the current applicant for the STB authorization, and on its heirs, successors, and assignees.
- C. The Signatories shall enforce the terms of this Agreement, approvals, and other conditions that incorporate this Agreement and its terms. Each shall notify the others if any of them becomes aware of an instance of possible non-compliance with the terms and conditions of this Agreement or permit or conditions as they relate to this Agreement. In such case, the Signatories shall ensure compliance consistent with their legal authorities and consult with the other agencies, as needed.

### **II. Applicability of this Agreement and Area of Potential Effects**

- A. This Agreement shall apply to the Undertaking licensed by the STB and all components of it, including the APE, actions specified in the EIS, permits and other approvals so long as they are within the jurisdiction of the Signatories.
- B. The STB will provide final determinations of eligibility for the National Register and findings of effect to the SHPO for concurrence for only those sites that are identified within the APE for the alternative licensed by the STB, if any. Any future refinements to the APE in conjunction with this Undertaking shall be made in consultation with the SHPO, consistent with 36 CFR 800.4.
- C. The STB shall ensure that all work carried out pursuant to this Agreement will be done by or under the direct supervision of historic preservation professionals who meet the appropriate Secretary of the Interior's Professional Qualifications Standards (36 CFR 61 Appendix A).

### **III. Tribal Consultation**

The STB initiated consultation with the Tribes listed in Attachment A.3 of this Agreement regarding the Section 106 process, in conjunction with the preparation of the EIS. Consultation will continue as the terms of this Agreement are carried out. No later than 60 days after issuance of any STB Final Decision granting ARRC the authority to construct and operate the Undertaking, and prior to the initiation of construction, the STB, in consultation with the SHPO and Tribes, shall complete a Plan for Tribal Consultation (PTC) that outlines procedures for agencies to consult with tribal organizations in carrying out the terms of this Agreement. The STB shall submit this PTC to the Tribes and provide them an opportunity to comment and decide if the terms are acceptable. The PTC shall describe when and how Tribes shall be consulted, the contact names and information for each organization (Attachment A.3), procedures for review of treatment plans (as appropriate), and other matters. A draft of the PTC is included as Attachment B to this Agreement and the PTC may be amended as needed. The procedures in the PTC will be integrated into the ID Plan and the agencies' implementation of this Agreement as necessary. All Federal agencies who endorse the Agreement will be provided with a copy of the PTC and agree to implement its terms.

### **IV. Identification of Historic Properties and Assessment of Effects**

- A. Additional identification and evaluation efforts for historic properties affected by the alternative licensed by the STB will be required as follows:
1. Any areas of surface/subsurface disturbance related to this Undertaking and within the jurisdiction of STB authority, including rail alignments as well as associated facilities, staging areas, and borrow areas, which are outside the 200-foot-wide APE surveyed in the Port MacKenzie Rail Extension Project Report of 2008 Cultural Resources Fieldwork (the 2008 Field Survey).
  2. Portions of the alternative for which ARRC has received authority from the STB to construct and operate that were not surveyed during the 2008 Field Survey.
  3. Previously identified sites within the surveyed APE and along the alternative that may receive authorization from the STB to construct and operate, which require additional evaluation to establish boundaries and/or to assess the effects of the Undertaking.
- B. Additional identification and evaluation shall conform with Federal and state guidelines for fieldwork in Alaska, be compatible with previous investigations for this Undertaking, follow the *Cultural Resources Work Plan: Proposed Port MacKenzie Rail Extensions Project, Port MacKenzie to Willow, Alaska STB Finance Docket No. 35095* (ID Plan, Attachment C) approved by the SHPO with comment on July 23, 2008, and may include a phased approach to testing and evaluation. Additional archaeological survey work shall meet the minimum level of effort to meet Level II (Evaluation Phase) survey requirements by the SHPO (i.e., gathering sufficient data for a determination of eligibility to the National Register but no determination of site boundaries).

- C. Should any non-archaeological properties be identified in the APE for the alternative licensed by the STB, the STB shall ensure that a historian or architectural historian who meets the Secretary of the Interior's Professional Qualifications Standards shall consult with SHPO and ARRC to establish the level of effort necessary to determine whether that property meets National Register criteria. Following consultation and agreement upon the level of effort, the STB shall make a reasonable and good faith effort to carry out the evaluation, and, prior to construction of the Undertaking, shall submit that determination to SHPO for review and concurrence, and shall distribute copies of the determination to all parties to this Agreement. The consultation, review, and concurrence for non-archaeological properties shall be coordinated with the reports submitted for the relevant segment(s) of the alternative licensed by the STB that are prepared for archaeological sites in accordance with Stipulations IV.D. through IV.H.
- D. The STB shall evaluate properties identified in the APE according to the survey method described in the ID Plan already developed and prepare a Cultural Resources Survey Report (CRSR) for each segment(s) of the alternative licensed by the STB, if any. The CRSR will describe each located property, and the property's known content and context. The CRSR will also indicate which archaeological resources present in the APE can be evaluated at the Phase I survey level as not eligible for the National Register, and present a justification for these evaluations. Properties evaluated as not eligible at the Phase I level will not require further testing and evaluation. The CRSR shall also identify areas of sensitivity where monitoring shall occur during construction, even though no historic properties have been identified in those areas. The CRSR shall include a summary of all previous CRSRs prepared for this Undertaking, make recommendations for the sequence and schedule for preparing additional CRSRs, and provide Section 106 review status of the remainder of segments in the selected alternative.
- E. Additionally, for each segment(s) of the alternative licensed by the STB that contains identified properties, if any, for which eligibility cannot be determined at the Phase I level, a Level II Testing and Evaluation Plan (TEP) shall be prepared. The TEP document may be combined with the CRSR. The TEP shall include the initial survey results and the proposed scope of archaeological testing efforts to establish the boundaries of historic properties located through archaeological survey per the ID Plan. The TEP will also describe for each located resource or type of resource procedures for site testing and evaluation for eligibility to the National Register. Usually, these testing procedures will follow standard archaeological practices, for example, shovel probe grids, excavation units, and trenching. Testing will focus on assessing the extent, depth, artifact content, features, and integrity of each archaeological resource. The CRSR/TEP shall be distributed to all parties to this Agreement, and the comments of those parties, including SHPO and Tribes, should be taken into consideration before detailed evaluation testing takes place. SHPO concurrence will be required for the Phase II TEP and for sites evaluated as not eligible at the Phase I level; if

SHPO does not concur with a finding that the site is not eligible, an additional TEP document will be prepared for these resources.

- F. After the TEP is carried out, the STB shall prepare a Phase II Testing and Evaluation Report (TER) for each segment(s) that includes the results of testing and evaluation of archaeological sites that would be directly affected by construction of the alternative licensed by the STB. The STB shall distribute the TER(s) to SHPO and all consulting parties to this Agreement who shall have a 30-day review and comment period. Comments shall address the adequacy of the Evaluation Phase assessments and provide their recommendations for determination of eligibility based on National Register criteria (36 CFR 60.4). Based on the comments received, the STB may revise the TER(s) or may conduct additional Evaluation Phase surveys, testing or both. Any revised Final TER shall be submitted by the STB to SHPO and all consulting parties to this agreement for a second 15-day review. If any reviewing party has an objection to the Final TER(s), they shall notify the STB within 15 days of receiving the reports for review or the Final TER(s) shall be considered complete.
- G. If after full review by all parties to this Agreement, no historic properties were identified within the APE for a specific segment, and the results of the TER for that segment have been accepted by all reviewing parties, then construction of the proposed project in this segment may be allowed by the STB upon concurrence from the SHPO with a finding of no historic properties affected for that segment.
- H. If the studies result in the identification of properties that are eligible for the National Register, the STB shall assess adverse effects in accordance with 36 CFR 800.5 and distribute a Finding of Effect Report for each segment where historic properties were identified within the APE. The Finding of Effect Report(s) shall describe the assessment of potential adverse effects to historic properties that would result from the construction or operation of the project, and identify mitigation measures that would eliminate or minimize effects to be incorporated into the design and construction documents of the Undertaking. The STB shall distribute the Finding of Effect Report(s) to SHPO and all consulting parties to this Agreement, who shall have a 30-day review and comment period. The STB shall ensure that comments are responded to prior to finalizing the Finding of Effect Report(s) for submission to the SHPO for final review and concurrence. The SHPO shall have an additional 30 days for review and concurrence with the findings in the Finding of Effect Report(s).

## **V. Treatment of Historic Properties**

- A. Any design changes, modifications, and refinements of the Undertaking shall endeavor to avoid impacts to cultural resources.
- B. For historic properties that cannot be avoided by the Undertaking and when the STB has made an adverse effect finding, ARRC shall develop treatment plans to minimize or mitigate the effects. Treatment plans shall be developed in consultation with all parties to this Agreement. During the preparation of treatment plans, the STB shall circulate a Draft Treatment Plan(s) to these parties, who will have 30 days to review

and provide comments. The STB shall consider the comments of these parties received within 30 days and incorporate comments received in the development of Final Treatment Plan(s). The Final Treatment Plan(s) shall be distributed to all parties who participated in their development for a final 30-day review and consultation period. Treatment plan(s) are considered final when the STB receives concurrence of the SHPO and any Tribes who participated in the development of the treatment plan(s). Under 43 CFR 7.7(a) "Protection of Archaeological Resources," tribes that consider any sites on public lands within the APE as having sacred or cultural importance have 30 days within which to comment on the treatment plans.

1. Most historic properties identified through the 2008 Field Survey are archaeological sites. For historic properties that are archaeological in nature and significant for their research data potential (criterion D), the treatment measures may follow standard mitigation through data recovery. Treatment plans for data recovery shall include, at a minimum, a research design with provisions for data recovery and recordation, analysis, reporting, and curation of resulting collection and records, and shall be consistent with the *Secretary of Interior's Standards and Guidelines* (48 FR 44734-44737). Treatment plans must be consistent with easement and permit requirements of other agencies, when applicable. To the extent possible, treatment plans should group related sites or areas, so that the treatment of related historic properties can be considered in context, and to minimize the burden of review and approval by agencies.
  2. A number of the historic properties identified during the 2008 Field Survey were sites relating to the historic period or were significant for values other than their potential research value (e.g., eligible under criterion A, B, or C), including the cultural landscape related to the Dena'ina cultural landscape and the Iditarod National Historic Trail and Iditarod Race cultural landscape. Treatment plans for such properties, if warranted, shall specify approaches for treatment or mitigation of the property in accordance with the principles, standards, and guidelines appropriate to the property's significance. This may include, but not be limited to, use of such approaches as relocating a historic property, re-landscaping to minimize indirect effects, public interpretation, ethnographic recordation, oral history, archival research, or modification of the Undertaking to minimize adverse effects. Methods of recordation and documentation described in the treatment plan shall conform to the *Secretary of the Interior's Standards for Architectural and Engineering Documentation* (48 FR 44730-44734) or other standards specified by the SHPO.
- C. In lieu of standard mitigation approaches described above, treatment plans may adopt other alternative approaches to minimize or mitigate effects to historic properties, including, but not limited to, assisting in the development of tribal historic preservation plans, developing detailed historic contexts for the region, developing educational materials, purchasing properties containing historic resources, or developing historic property management plans.



- D. Disputes or objections to treatment plans shall be resolved in accordance with stipulation XII below.

## **VI. Monitoring**

- A. If stipulated as part of a treatment plan, when the probability to uncover unidentified archaeological or historic materials is determined likely by the consulting archaeologist or the SHPO, ARRC shall ensure that an archaeologist meeting the Secretary of the Interior's Standards and Guidelines (*36 CFR § 61, Appendix A, hereafter Standards and Guidelines*) is present to monitor specific ground-disturbing activities.
- B. The results of monitoring shall be included in a report to the STB and the SHPO and made available to all parties to this Agreement. This report shall be developed, within 3 months of fieldwork and be acceptable to both the STB and the SHPO.
- C. If sites are discovered during monitoring, ARRC shall follow the procedures outlined in Stipulation IX of this Agreement.
- D. If human remains are discovered during monitoring, ARRC shall follow the procedures outlined in Stipulation X and the Plan of Action (Attachment A).

## **VII. Curation**

- A. ARRC shall ensure that all artifacts, faunal remains, samples, records and field notes, and related materials collected during activities covered by this Agreement are deposited in the University of Alaska Museum of the North in Fairbanks, or another repository or institution approved by the SHPO. The curatorial facility shall meet requirements found in 36 CFR Part 79, *Curation of Federally Owned and Administered Archaeological Collections*.
- B. Curation arrangements between ARRC, or their cultural resources consultant, and an approved institution must be part of any treatment plan.
- C. ARRC shall incur all reasonable costs charged by the approved institution for curation of materials collected in conjunction with recovery actions under this Agreement. "Reasonable costs" shall be determined by the curatorial facility and approved by the SHPO, and be consistent with professionally acceptable curatorial standards.
- D. Consistent with 36 CFR Part 79, collections shall be packaged in archival quality materials and in a manner appropriate to the material type. Collection preparation and packaging shall be acceptable to the SHPO and receiving institution, and consultation in advance is recommended.
- E. Materials collected in conjunction with recovery actions under this Agreement will remain the property of the landowner unless a gift or purchase agreement is negotiated.

## VIII. Annual Meeting and Reports

- A. **Annual Meeting.** The STB shall hold a meeting of the Signatories and Invited Signatories, as well as the Concurring Parties if they so wish, within one year of any STB final decision granting ARRC the authority to construct and operate the Undertaking, and each year by that same date, thereafter until construction of the Undertaking is completed or this Agreement is terminated, to discuss the previous year's activities and activities scheduled for the upcoming year. The meeting shall be held in Anchorage at the Alaska Office of History and Archaeology or at another location by consensus of the Signatories and Invited Signatories. The parties may participate by telephone if they so desire and minutes of the meetings will be distributed as soon as possible afterwards.
- B. **Additional Meetings.** If any party deems a meeting necessary in addition to the annual meeting described above, their request shall be considered in consultation with the other parties.
- C. **Annual Report.** ARRC or their designated consultant shall prepare an annual report on the progress of implementation of the stipulations of this Agreement, and shall distribute it to all parties to this Agreement at least 45 days prior to the Annual Meeting. The annual report shall include the following:
1. A description of the tasks accomplished during the preceding year and anticipated upcoming efforts for identification, evaluation, mitigation, and protection of historic properties. This can include descriptions of sites, artifacts encountered, or other archaeological or historic materials encountered, including representative photographs and illustrations;
  2. A description of the progress of the Undertaking and any known or expected changes to the Undertaking;
  3. An evaluation of the effectiveness of this Agreement and whether any amendments or changes are needed based on deficiencies or project modifications.
- D. **Additional Reporting.** Implementation of this Agreement shall include administrative reporting on progress as well as the preparation of technical reports on resource investigations. The reporting shall use the following procedures unless modifications to this reporting structure are agreed to by the STB, the SHPO, and Invited Signatories and reflected in the ID Plan.
1. **Progress reports.** Progress reports shall be submitted quarterly by ARRC to the STB for the duration of the construction portion of the Undertaking following execution of this Agreement. Progress reports may be in letter format and shall describe fieldwork activities for historic properties as well as relevant construction progress that was initiated, underway, or completed for the most recent performance period, and identify steps to be initiated, continued, or completed in the next quarter. These reports may be combined with other STB reporting requirements.

2. Progress summaries. Progress summaries shall be submitted by the STB to the SHPO and Invited Signatories every six months for the duration of the construction portion of the Project. The first progress summary shall be distributed six months following execution of this Agreement, with subsequent summaries following each six months thereafter until the construction portion of the Undertaking is completed. The progress summaries shall identify steps initiated, underway, or completed for the most recent performance period and identify steps to be initiated, continued, or completed in the next six-month period.
3. Preliminary field reports. Preliminary reports on the progress of historic property fieldwork shall be prepared by ARRC that demonstrate the completion of test and evaluation, data recovery, or other procedures, investigations and site treatments approved in the treatment plans. The use of preliminary field reports is designed to facilitate a phased approach to resource evaluation and mitigation, as provided for in 36 CFR 800, and to facilitate reasonable construction planning and progress. Preliminary field reports may be included in, but do not take the place of, the CRSRs prepared in Stipulation IV.D. and TER(s) prepared in Stipulation IV.F.
4. Technical reports. Technical reports describing the results of background research, fieldwork activities, and laboratory analyses shall be prepared by ARRC according to the standards and permit guidelines appropriate to the resource, including final report standards for archaeological excavation. The extent of report distribution as well as procedures for review of draft and final technical reports shall be in accordance with Stipulations IV, V and VI. ARRC shall issue final technical reports no later than two years from the completion of fieldwork activities and, in consultation with the SHPO, shall prepare sufficient copies for dissemination to the Concurring Parties, appropriate public libraries, educational institutions, and other repositories.

## **IX. Procedures for Inadvertent or Unanticipated Discoveries**

- A. Upon the inadvertent discovery of a potential historic property in any activity's APE, all work in the vicinity shall immediately cease and ARRC shall protect the discovery site against further disturbance.
- B. Upon the inadvertent discovery of human remains, sacred objects, or mortuary objects in any activity's APE, all work in the vicinity shall immediately cease and a plan of action for the treatment of human remains (Attachment A) shall be implemented. ARRC shall ensure that any and all human remains, sacred objects, and objects of cultural patrimony discovered as a result of activities related to the Undertaking will be treated with dignity and respect.
- C. Upon the unanticipated discovery of cultural resources during construction that are not human remains, the Unanticipated Discoveries Plan shall be followed (Attachment A.2).

## **X. Treatment of Human Remains**

It is the intent of this Undertaking to avoid the disturbance or removal of any human remains. No activity will knowingly disturb human graves or human remains. If human remains, sacred objects, or mortuary objects are inadvertently discovered during the course of construction or operation, all activities in the vicinity shall immediately cease and the Plan of Action (POA) for the treatment of human remains (Attachment A) shall be implemented. The STB and ARRC shall ensure that any and all human remains, sacred objects, and objects of cultural patrimony discovered as a result of the Undertaking shall at all times be treated with dignity and respect. Notification and consultation with Tribes shall be conducted in accordance with PTC described above in Stipulation III.

## **XI. Training**

- A. On an annual basis, ARRC will ensure that on-site supervisory-level employees and contractors are trained in procedures for identifying and reporting historic properties that may potentially be discovered during the course of their work. The training shall be developed with sensitivity to concerns of Tribes and offer the opportunity for a tribal representative to meet in person with employees and contractors if a Tribe so requests. Minimally, the training shall include guidelines for identification of cultural resources, and notification procedures when archaeological materials, human remains, and historic period sites are discovered.
- B. ARRC shall also ensure that its supervisory-level contractors and employees are advised against the illegal collection of historic and prehistoric materials, including human remains, and are familiarized with the scope of applicable laws and regulations.
- C. Prior to the implementation of training, the curriculum shall be reviewed and approved by the STB, the SHPO, Tribes, and MSB.
- D. Training shall be conducted by an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards (36 CFR Part 61). However, ARRC's supervisory level employees and contractors may attend the above training and convey the information to staff unable to attend.
- E. On an annual basis, and included in the annual report prepared under Stipulation VIII.C, ARRC shall supply to the STB and the SHPO a list of employees and contractors who attended the annual training, and procedures through which the information was conveyed to employees and contractors who did not attend.

## **XII. Dispute Resolution**

Should any party to this Agreement object within 30 days of any treatment plan or report provided for review or actions proposed pursuant to this Agreement, the STB and the SHPO shall consult with the objecting party to resolve the objection.

- A. If the STB and/or the SHPO determine that the objection cannot be resolved, the STB shall forward all documentation relevant to the dispute to the ACHP. Within 30 days after receipt of all pertinent documentation, the ACHP will either:

1. Provide the STB with recommendations, which the agency will take into account in reaching a final decision regarding the dispute; or
  2. Notify the STB that it will comment pursuant to 36 CFR 800.7, and proceed to comment. Any ACHP comment provided in response to such a request shall be taken into account by the STB with reference to the subject of the dispute. The STB will provide a copy of its written response to ACHP comments or final decision on any dispute to all parties to the Agreement before proceeding. Any recommendation or comment provided by the ACHP shall be understood to pertain to the subject of the dispute; the STB's responsibility to carry out all actions under this Agreement that are not the subjects of the dispute shall remain the same.
- B. At any time during implementation of the measures stipulated in this Agreement, should an objection to any such measure or its manner of implementation be raised by a member of the public, the STB shall take the objection into account and consult as needed with the objecting party, the SHPO, or the ACHP to resolve the objection.

### **XIII. Amendments**

Any Signatory or Invited Signatory to this Agreement may make a request to the STB that the other Signatories consider amending it, whereupon the parties shall consult to consider the amendment(s). Amendments will be executed in the same manner as the original Agreement. Concurring Parties may suggest proposed amendments to the Signatories and Invites Signatories, who shall consult to consider them.

### **XIV. Termination**

Any Signatory or Invited Signatory to this Agreement may terminate it by providing 30 days notice to the other parties explaining the reasons for the termination. The Signatory or Invited Signatory shall consult during this period to seek agreement on amendments or other actions that will avoid termination. In the event of termination, the STB will comply with 36 CFR 800.1 through 800.7 on remaining Undertaking components, activities, or outstanding issues.

### **XV. Duration**

This Agreement shall become effective upon execution by the STB, FRA, the ACHP and the SHPO, and shall remain in effect for a term of five years from its date of execution, at which point the Agreement may be renewed.

### **XVI. Execution and Implementation**

Execution and implementation of this Agreement evidences that the STB and FRA have satisfied responsibilities under Section 106 of the National Historic Preservation Act pursuant to 36 CFR 800.

## **J.3 Signatories**

### **J.3.1 Participating Signatories**

Surface Transportation Board

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Victoria Rutson, Chief, Section of Environmental Analysis

Advisory Council on Historic Preservation

By: \_\_\_\_\_ Date: \_\_\_\_\_  
John M. Fowler, Executive Director

Alaska State Historic Preservation Officer

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Judith E. Bittner, State Historic Preservation Officer

### **Cooperating Federal Agencies**

Federal Railroad Administration

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Mark Yachmetz, Associate Administrator for Railroad Development

### **J.3.2 Invited Signatories**

#### **Tribes**

Knik Tribal Council

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Jack Alcorn, Executive Director

#### **Applicant**

Alaska Railroad Corporation

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Patrick K. Gamble, President

### **J.3.3 Concurring Parties**

#### **Agencies**

State of Alaska, Department of Natural Resources

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Director, Division of Mining, Land, and Water

Matanuska-Susitna Borough Historical Commission

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Fran Seager-Boss, Cultural Resources Specialist

## **Tribes**

### **Chickaloon Village Traditional Council**

By: \_\_\_\_\_  
Gary Harrison, Chief

Date: \_\_\_\_\_

### **Native Village of Eklutna**

By: \_\_\_\_\_  
Dorothy Cook, President

Date: \_\_\_\_\_

### **Native Village of Tyonek**

By: \_\_\_\_\_  
Angela Sandstol, President

Date: \_\_\_\_\_



## J.4 References

- ADNR, OHA (Alaska Department of Natural Resources, Office of History and Archaeology). Not dated. Alaska Heritage Resources Survey. Anchorage, AK: Database on File with State Office of History and Archaeology.
- ADNR, OHA. Not dated. Citations Database. Anchorage, AK: Database on file with State Office of History and Archaeology.
- ADNR, OHA. 2003a. Determination of Eligibility. Historic Preservation Series Number 7.
- ADNR, OHA. 2003b. Review and Compliance Program Guidelines for Section 106 Consultation with the State Historic Preservation Office. Historic Preservation Series Number 8.
- ADNR, OHA. 2004. SURF Database. Anchorage, AK: On file with State Office of History and Archaeology.
- HDR Alaska, Inc. and TNH-Hanson, LLC. 2008. Preliminary Environmental and Alternatives Report for the Port MacKenzie Rail Extension Project. 4 Volumes. Prepared for the Matanuska-Susitna Borough and the Alaska Railroad Corporation, Anchorage, AK.
- NPS (National Park Service). Not dated. Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines [As Amended and Annotated], Secretary of the Interior's Standards for Archeological Documentation. Online at [http://www.cr.nps.gov/local-law/arch\\_stnds\\_7.htm](http://www.cr.nps.gov/local-law/arch_stnds_7.htm)
- NPS (National Park Service). Not dated. National Register of Historic Places. Online at: <http://www.cr.nps.gov/nr/nrlist.htm>
- NPS. 1997. How to Apply the National Register Criteria for Evaluation. National Register Bulletin 15. U.S. Department of the Interior, National Park Service, National Register, History and Education. Online at: <http://www.cr.nps.gov/nr/publications/bulletins/nrb15/>
- Parker, P. L., and T. F. King. 1998. Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Bulletin (revised). U.S. Department of the Interior, National Park Service, National Register, History and Education, National Register of Historic Places.
- SRB&A. 2008. Port MacKenzie Rail Extension Project Report of 2008 Cultural Resources Fieldwork. Prepared for Surface Transportation Board. Washington, DC.

## J.5 Glossary of Terms and Acronyms

**Adverse Effect:** When an undertaking may alter, directly or indirectly, the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the Undertaking that may occur later in time, be farther removed in distance, or be cumulative.

**Area of Potential Effects:** The Area of Potential Effects (APE) means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the Undertaking. Determination of the APE may take into account the professional standards, guidance, and research of both the historic properties and railroad design professions.

**Borrow Area(s):** An excavated area where material has been or will be dug for use as fill at another location.

**Consulting Parties:** Consulting parties include the SHPO, Indian tribes, representatives of local governments, applicants for Federal assistance, permits, licenses and other approvals, and certain individuals and organizations with a demonstrated interest in the Undertaking.

**Cultural Resource:** any tangible or observable evidence of past human activity, regardless of significance, found in direct association with a geographic location, including tangible properties possessing intangible traditional cultural values.

**Curation:** The preservation of material remains that are excavated or removed during a survey, excavation, or other study of a prehistoric or historic resource, and associated records that are prepared or assembled in connection with the survey, excavation or other study.

**Days:** Calendar days.

**Eligible for the National Register of Historic Places:** In order to be eligible for the National Register the property must have been either formally determined as such in accordance with regulations of the Secretary of the Interior and/or meet the National Register criteria.

**Federal Agency(s):** Any Federal entity with a statutory obligation to fulfill the requirements of Section 106 who has jurisdiction over an undertaking and takes legal and financial responsibility for Section 106 compliance in accordance with 36 CFR 800 Subpart B. The Federal Agency(s) has approval authority for the Undertaking and can commit the Federal agency to take appropriate action for a specific undertaking as a result of Section 106 compliance.

**Historic Property:** Any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian Tribe and that meet the National Register criteria.

**Human Remains:** The physical remains of a human body.

**ID Plan:** Identification Plan Entitled *Cultural Resources Work Plan: Proposed Port MacKenzie Rail Extensions Project, Port MacKenzie to Willow, Alaska STB Finance Docket No. 35095* (ID Plan) approved by the SHPO with comment on July 23, 2008.

**Indian Tribe:** As presently defined in 36 CFR 800.16(m), an Indian Tribe, band, nation, or other organized group or community, including a federally-recognized Native Village, Regional Corporation or Village Corporation, as those terms are defined in Section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602) which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

**Keeper of the National Register:** The Keeper is the individual who has been delegated the authority by the National Park Service (NPS) to list properties and determine their eligibility for the National Register. The Keeper may further delegate this authority as he or she deems appropriate.

**NAGPRA:** Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et. seq.).

**National Register:** The National Register means the National Register of Historic Places maintained by the Secretary of the Interior.

**National Register Criteria:** National Register criteria means the criteria established by the Secretary of the Interior for use in evaluating the eligibility of properties for the National Register (36 CFR 60). The National Register of Historic Places criteria are listed below:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship and feeling and:

- that are associated with the events that have made a significant contribution to the broad patterns of our history; or
- that are associated with the lives of persons significant in our past; or
- that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- that yielded, or may be likely to yield, information on prehistory or history.

Criteria considerations: ordinarily cemeteries, birthplaces, or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations, commemorative in nature; and properties that have achieved their significance within the past 50 years shall not be considered eligible for the National Register of Historic Places (36 CFR 60.4).

**NRHP:** National Register of Historic Places.

**DPA:** Draft Programmatic Agreement.

**SHPO:** State Historic Preservation Officer.

**Site:** Site definition is different for each state but is generally defined by Willey and Phillips (1958:18), as any reasonably definable spatial unit that contains features or is fairly continuously covered with artifacts that are indicative of an occupation 50 years or older. A site may be defined as "a spatial cluster of cultural features, or items, or both" (Binford 1972:46). These definitions apply to both prehistoric and historic sites. Archaeological context may be defined by the inclusion of any of the following: soil staining, associated fire-cracked rock, ceramics, features, or a concentration of materials within a reasonably defined spatial boundary.

**STB:** Surface Transportation Board.

**Traditional Cultural Properties:** A Traditional Cultural Property can be defined generally as an object, site, landscape feature, or other form of feature that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that communities' history, and (b) are important in maintaining the continuing cultural identity of the community. For additional information, reference Parker and King, 1995.

**Treatment Plan:** A proposal for the mitigation of effects upon any historic property that a project would affect. It can include data recovery, documentation, restoration or other measures.

**Undertaking:** An undertaking is a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency. This includes those carried out by or on behalf of a Federal agency, those carried out with Federal financial assistance, those requiring a Federal permit, license or approval, and those subject to state or local regulation pursuant to a delegation or approval by a Federal agency. For this PA, the Undertaking refers to the STB's review of an application for the construction and operation of a rail line by the ARRC, extending its existing system between the Matanuska-Susitna Borough and a point between Wasilla and north of Willow, Alaska.

# **ATTACHMENT A**

## **PLAN OF ACTION FOR THE TREATMENT OF UNANTICIPATED DISCOVERY OF HUMAN REMAINS, GRAVES AND HISTORIC PROPERTIES**

### **A.1. Human Remains and Graves**

The Native American Graves Protection and Repatriation Act (NAGPRA) regulations (43 CFR 10), do not apply to the Undertaking because it would not occur on Federal lands. The following steps must be taken if human remains, or suspected human remains, are discovered:

1. Should human burials be encountered, work will be stopped at once in the locality and the STB, the SHPO and the Alaska State Troopers (AST) shall be contacted immediately. See below for contact numbers.
2. If the human remains appear recent in the judgment of the archaeologists, the STB shall defer to the opinion of the AST and Alaska State Medical Examiner (Alaska SME) for a determination of whether the remains are of a forensic nature and /or subject to criminal investigation.
3. If the racial identity of the human remains is in question, a physical anthropologist experienced in the analysis of human remains shall examine them. The physical anthropologist shall document, analyze, and photograph the remains so that an independent assessment of racial identity can be made. The physical anthropologist shall be afforded no more than 30 days time to conduct his or her analysis.
4. If the human remains are on Federal land and determined to be of Native American origin, the STB will follow NAGPRA regulations and procedures set forth in 43 CFR 10. If the human remains are not Native American, and a determination has been made by the AST and Alaska SME that a death investigation is not warranted, then the STB in consultation with the Alaska SME, will attempt to identify, locate and inform descendants of the deceased. If the human remains are to be moved, then the STB shall obtain any required permits from the Alaska State Bureau of Vital Statistics, and reinter the remains in a designated area.
5. The ARRC Project Manager should contact the following people or agencies within 24 hours of uncovering the remains (notification should include available information regarding the nature and extent of the remains and an accurate and precise location including GPS coordinates):

**A. State Historic Preservation Officer (SHPO)**

Judith Bittner  
State Historic Preservation Officer  
Alaska Department of Natural Resources  
550 W. 7th Ave., Suite 1310  
Anchorage, AK 99501-3565  
Phone: (907) 269-8721  
Fax: (907) 269-8908

**B. Federal agency official in charge**

Victoria Rutson  
Chief, Section of Environmental Analysis  
Surface Transportation Board  
395 E Street SW  
Washington, DC 20423  
Phone: (202) 245-0295  
Fax: (202) 245-0454

**C. The appropriate land managing agency contact for the relevant parcel**

**D. The responsible Native representative for the area of discovery**

Dorothy Cook  
President  
Native Village of Eklutna  
26339 Eklutna Village Road  
Chugiak, Alaska 99567  
Phone: 907-688-6020  
Fax: 907-688-6021

Curtis McQueen  
Chief Executive Officer  
Eklutna, Incorporated  
16515 Centerfield Dr., Suite 201  
Eagle River, AK 99577  
Phone: 907-696-2828  
Fax: 907-696-2845

Debra Call  
Knik Tribal Council President  
PO Box 871565  
Wasilla, Alaska 99687-1565  
Phone: 907-373-7991  
Fax: 907-373-2161  
[dcall@kniktribe.org](mailto:dcall@kniktribe.org)  
[dcall@alaskanative.net](mailto:dcall@alaskanative.net)

Delia Call  
Knik Tribal Council Secretary Treasurer  
PO Box 871565  
Wasilla, Alaska 99687-1565  
Phone: 907-373-7991  
Fax: 907-373-2161

Jack Alcorn  
Executive Director  
Knik Tribal Council  
PO Box 871565  
Wasilla, Alaska 99687-1565  
Phone: 907-373-7991  
Fax: 907-373-2161

Raymond Theodore  
President  
Knikatnu, Incorporated  
P.O. Box 872130  
Wasilla, Alaska 99687-2130  
Phone: 907-376-2845  
Fax: 907-376-2847

Angela Sandstol  
President  
Native Village of Tyonek  
PO Box 82009  
Tyonek, Alaska 99682-0009  
Phone: 907-583-2201  
Fax: 907-583-2442

Gary Harrison  
Chief  
Chickaloon Village Traditional Council  
P.O. Box 1105  
Chickaloon, AK 99674-1105  
Phone: 907-745-0707  
Fax: 907-745-0709

Donita Hensley  
President  
Tyonek Native Corporation  
1689 C St., Suite 219  
Anchorage, AK 99501-5131  
Phone: 907-272-0707  
Fax: 907-274-7125

Edith Baller  
President  
Chickaloon-Moose Creek Native Association, Inc.  
P.O. Box 875046  
Wasilla, AK 99687  
Phone: 907-373-1145  
Fax: 907-373-1004

Gloria O’Niell  
President and Chief Executive Officer  
Cook Inlet Tribal Council  
3600 San Jeronimo Dr.  
Anchorage, AK 99508  
Phone: 907-793-3600  
Fax: 907-793-3602

**E. The Alaska State Troopers**

Communications Center Manager  
Phone: (907) 451-5100  
Fax: (907) 451-5165

6. The ARRC Project Manager should contact the following people, though not necessarily within the first 24 hours:

**A. Alaska State Medical Examiner’s Office**

Dr. Katherine Raven, Chief Medical Examiner  
Phone: (907) 334-2200  
Fax: (907) 334-2216  
Email: [Stanton.kessler@alaska.gov](mailto:Stanton.kessler@alaska.gov)

Kenneth Cramer, Death Investigator  
Phone: (907) 334-2200  
Fax: (907) 334-2216  
Email: [Kenneth.Cramer@alaska.gov](mailto:Kenneth.Cramer@alaska.gov)



## **B. Alaska Bureau of Vital Statistics**

Phillip Mitchell, Chief  
Phone: (907) 465-8643  
Fax: (907) 465-3618  
Email: [Phillip.Mitchell@alaska.gov](mailto:Phillip.Mitchell@alaska.gov)

Janet Shea  
Phone: (907) 465-8608  
Fax: (907) 465-4689  
Email: Janet L Shea [janet.brown@alaska.gov](mailto:janet.brown@alaska.gov)

Aaron Leggett  
Dena'ina Cultural Historian  
Alaska Native Heritage Center  
8800 Heritage Center Drive  
Anchorage, Alaska 99504  
Phone: 907-330-8000  
Fax: 907-330-8030  
[info@alaskanative.net](mailto:info@alaskanative.net)

Margaret L. Brown  
President and Chief Executive Officer  
Cook Inlet Region, Inc.  
2525 C Street, Suite 500  
P.O. Box 93330  
Anchorage, Alaska 99509-3330  
Phone: 907-274-8638  
Fax: 907-263-5183

Fran Seager-Boss  
Matanuska Susitna Borough Historic Commission  
Matanuska Susitna Borough  
Cultural Resources Specialist  
350 East Dahlia Avenue  
Palmer, Alaska 99645  
[fseagerboss@matsugov.us](mailto:fseagerboss@matsugov.us)

## **A.2. Plan for Unanticipated Discoveries**

Historic properties may be encountered above ground and below ground during work on the Undertaking, and might include historic and prehistoric materials as well as Traditional Cultural Properties. In the event that cultural materials are discovered, this plan shall be followed, and implemented in compliance with the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. § 470) as well as implementing regulations (36 CFR 800).

If archaeological or historic materials are encountered the following series of steps must be followed:

1. Stop all work in the immediate vicinity of any historic properties or suspected cultural resources.
2. Mark the area in which the resources are located, as well as a minimum buffer area with a radius of 20 meters surrounding them. This buffer area may be larger if there is the possibility of more resources in the area or in the case of slopes or cut banks where ongoing work may impact the site. Make sure that all cultural materials are protected from possible impacts while contacting the appropriate parties<sup>2</sup>.
3. ARRC's Project Manager should contact the people or agencies in the previous list at A.1(6)(a) through (e) within 24 hours of discovering the resources.

Notification of unanticipated discoveries should include available information regarding the nature and extent of the historic properties and an accurate and precise location including GPS coordinates.

The discovery shall be investigated by a professional meeting the appropriate qualification standards, such as a consulting archaeologist, no longer than seventy-two (72) hours from discovery. The STB, the SHPO, ARRC and land managing agency (as appropriate) shall consult, by telephone or other means, on the nature of the discovery and whether any additional investigation is warranted. The STB shall contact the appropriate Tribal representative if necessary. A decision shall be provided to ARRC within five (5) working days. If the parties agree that the discovery is not significant, verbal authorization to proceed may be given by the SHPO, and the SHPO shall provide written confirmation to the parties within five (5) working days. A report of the investigation shall be provided by the investigator, following the guidelines for Monitoring described in Stipulation VII. If additional investigation is agreed to, the guidelines for Additional Investigations described in Stipulation III.B. shall be followed, unless modified evaluation and reporting are agreed to.

### **A.3. Tribes and Alaska Native Organization Contact List**

#### **Federally Recognized Tribes**

Gary Harrison, Chief  
**Chickaloon Village Traditional Council**  
Send information to:  
Jennifer Harrion, Executive Director  
P.O. Box 1105  
Chickaloon, AK 99674-1105  
Phone: 907-745-0707  
Fax: 907-745-0709

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2 Options for protecting the cultural resources include: covering with a tarp or other protection from the elements; shoring up cut banks or trench walls so that no further exposure occurs; making sure that no water will collect on or around the site.

Dorothy Cook, President  
**Native Village of Eklutna**  
26339 Eklutna Village Road  
Chugiak, Alaska 99567  
Phone: 907-688-6020  
Fax: 907-688-6021

Debra Call, President  
**Knik Tribal Council**  
PO Box 871565  
Wasilla, Alaska 99687-1565  
Phone: 907-373-7991  
Fax: 907-373-2161  
dcall@kniktribe.org  
dcall@alaskanative.net

Delia Call, Secretary Treasurer  
**Knik Tribal Council**  
PO Box 871565  
Wasilla, Alaska 99687-1565  
Phone: 907-373-7991  
Fax: 907-373-2161

Jack Alcorn, Executive Director  
**Knik Tribal Council**  
PO Box 871565  
Wasilla, Alaska 99687-1565  
Phone: 907-373-7991  
Fax: 907-373-2161

Angela Sandstol, President  
**Native Village of Tyonek**  
PO Box 82009  
Tyonek, Alaska 99682-0009  
Phone: 907-583-2201  
Fax: 907-583-2442

### **Alaska Native Corporations**

Curtis McQueen, Chief Executive Officer  
**Eklutna, Incorporated**  
16515 Centerfield Dr., Suite 201  
Eagle River, AK 99577  
Phone: 907-696-2828  
Fax: 907-696-2845

Raymond Theodore  
**Knikatnu, Incorporated**  
P.O. Box 872130  
Wasilla, Alaska 99687-2130  
Phone: 907-376-2845  
Fax: 907-376-2847

Donita Hensley, President  
**Tyonek Native Corporation**  
1689 C St., Suite 219  
Anchorage, AK 99501-5131  
Phone: 907-272-0707  
Fax: 907-274-7125

Edith Baller, President  
**Chickaloon-Moose Creek Native Association, Inc.**  
P.O. Box 875046  
Wasilla, AK 99687  
Phone: 907-373-1145  
Fax: 907-373-1004

Gloria O’Niell, President and Chief Executive Officer  
**Cook Inlet Tribal Council**  
3600 San Jeronimo Dr.  
Anchorage, AK 99508  
Phone: 907-793-3600  
Fax: 907-793-3602

Margaret L. Brown, President and Chief Executive Officer  
**Cook Inlet Region, Inc.**  
2525 C Street, Suite 500  
P.O. Box 93330  
Anchorage, Alaska 99509-3330  
Phone: 907-274-8638  
Fax: 907-263-5183

### **Other Organizations**

Aaron Leggett, Dena’ina Cultural Historian  
Alaska Native Heritage Center  
8800 Heritage Center Drive  
Anchorage, Alaska 99504  
Phone: 907-330-8000  
Fax: 907-330-8030  
info@alaskanative.net

## **ATTACHMENT B**

### **PLAN FOR TRIBAL CONSULTATION**

#### **B.1. Introduction**

Executive Order (EO) 13175 (65 FR 218), Consultation and Coordination with Indian Tribal Governments (November 6, 2000) directs Federal agencies to establish regular and meaningful consultation and collaboration with officials of Federally Recognized Tribal Governments (Tribes) in the development of Federal policies or decisions that have Tribal implications. The Environmental Impact Statement (EIS) for Alaska Railroad Corporation's (ARRC) Proposed Port MacKenzie Rail Extension will culminate in a Final Decision (i.e., Record of Decision) by the Surface Transportation Board (STB) and, as appropriate, subsequent permit decisions by other Federal agencies that constitute Federal decisions subject to the provisions of EO 13175.

The proposed ARRC Port MacKenzie Rail Extension has the potential to directly affect the environment, resources and rights of Tribes and Alaska native corporations located in Southcentral Alaska in the vicinity of the Knik Arm, Big Lake and the Little Susitna River. Potential effects to Tribal lands, rights, resources, religious or cultural sites and subsistence activities need to be identified, evaluated and discussed with Tribal Governments in order to comply with EO 13175, Section 106 of the National Historic Preservation Act of 1966 (see also 36 CFR Part 800, August 5, 2001) and other Federal regulations and policies.

##### **B.1.1 Federally Recognized Tribal Governments in the Project Area**

The U.S. Department of Interior, Bureau of Indian Affairs (BIA) maintains a list of 561 Federally Recognized Tribes (73 FR 66, April 4, 2008). Alaska Tribes in proximity to the proposed Port MacKenzie Rail Extension have been identified from this list. Proximity is defined as in or near the Little Susitna River and Knik Arm watersheds. The following Tribes, Tribal groups and Native corporations were notified by letter dated February 12, 2008 of the scoping process for the Port MacKenzie Rail Extension EIS, and have been advised that further information regarding government-to-government coordination would be forthcoming.

##### **Federally Recognized Tribes**

- Chickaloon Village Traditional Council
- Knik Tribal Council
- Native Village of Eklutna
- Native Village of Tyonek

## Alaska Native Corporations

- Chickaloon-Moose Creek Native Association, Inc.
- Cook Inlet Region, Inc.
- Eklutna, Incorporated
- Knikatu, Incorporated
- Tyonek Native Corporation

### B.1.2 Completed Consultation

The STB initiated consultation with the Tribes listed in Attachment A of this Agreement regarding the Section 106 process during the early scoping stages of the preparation of the EIS. The Government to Government Consultation and Coordination Plan prepared for this Undertaking on June 18, 2009, identifies the Tribes who were notified by letter, of the scoping process for the EIS on February 12, 2008. Attachment A. of this Agreement lists the Tribes and Alaska native organizations who have remained in consultation with the STB after the scoping process. On February 5, 2009, the STB sent a letter to all of the Tribes and Alaska native organizations notifying them of the initiation of the Section 106 consultation process, asking them for assistance in identifying cultural resources in the project area, and asking if they were interested in participating as a consulting party to this Agreement. Consultation completed with specific Tribes and Alaska native organizations included:

- August 20, 2008, **Knikatu, Inc.** requested a meeting with the STB and cooperating agencies at a tribal facility and indicated they want to continue to receive project information by mail and participate in the public involvement process. A follow-up phone call was made on December 9, 2008, and while an immediate meeting was not necessary, the request was made that the Knikatu, Inc. be informed if the Houston route is selected. The Knikatu, Inc. would like to receive project information by mail and participate in the public involvement process, and may request a meeting with the STB at a later date.
- September 3, 2008, **Native Village of Tyonek** indicated they want to continue to receive project information by mail and participate in the public involvement process.
- April 1, 2009, **Eklutna, Inc.** indicated they have no interest in the project and further consultation is not required.
- February 27, 2009, a consultation meeting was held with the **Knik Tribal Council** and the **Matanuska-Susitna Borough (MSB) Historical Commission** with STB's consultant archaeologist, Stephen R. Braun & Associates. The majority of the meeting focused on Knik Tribal Council's desire to have the discussion of Dena'ina be broadened to a cultural landscape level and focus on not only prehistoric and ethnographic resources, but also the contemporary cultural practices of the Dena'ina and how these practices reflect their past as well as show the Dena'ina as a living part of the landscape today. The MSB Historical Commission representatives agreed with the Knik Tribal Council's concerns regarding documentation of Dena'ina cultural resources and that they be expanded to a broader cultural landscape discussion.

- November 13, 2009, follow-up phone calls were made to all Tribes and Alaska native organizations to confirm their role in the Agreement as a consulting party or to continue to be included in the document circulation and contact lists.

### **B.1.3 Continuing Consultation**

STB consultation with the Tribes will remain open throughout the duration of the Project and as the terms of this Agreement are carried out. Copies of the Project's Draft EIS and Final EIS shall be sent to all of these Tribes and Alaska native organizations for review. Both documents shall contain the draft Agreement as an appendix. If further research or analysis results in the identification of other Tribes with interests or cultural ties to the Project, they will also be added to the list of consulting Tribes. Consultation methods will vary depending on the requests from the Tribes. Consultation types may vary from letters, phone calls, on-site meetings and various levels of documentation for review, to jointly developing site specific treatment plans and/or agreement documents. Consultation may also vary according to the type of resource involved, the periods when the various tribes are known to have occupied the project vicinity, and which alternative is ultimately licensed by the STB.

### **B.1.4 Objectives of Consultation and Coordination**

Consultation and coordination is the process of seeking, discussing, and considering the views of Tribes. Two-way communication that works toward consensus and reflects the concerns of the affected Tribes is the primary objective for the STB's consultation and coordination plan. Tribal sovereignty, culture, traditional values and customs will be respected during the consultation process.

The STB, U.S. Coast Guard and Federal Railroad Administration do not have specific guidance documents for consultation and coordination with Tribal Governments. Established guidance documents from the U.S. Department of Defense, U.S. Army Corps of Engineers - Alaska District, U.S. Environmental Protection Agency - Region 10, and State of Alaska were considered in development and implementation of the consultation and coordination plan for the Port MacKenzie Rail Extension Project EIS. Specific objectives for consultation include:

1. Engage all potentially affected Tribes early in the EIS process to identify issues that should be researched and analyzed in the EIS.
2. Maintain open and active communications with Tribes throughout the EIS process to identify places of traditional religious or cultural importance and potential effects to Tribal lands, rights, resources or subsistence activities in the vicinity of the proposed project.
3. Report to the Tribes in a credible and understandable manner on issues and concerns raised during the scoping process.
4. Respond to issues raised by the Tribes during scoping and on the Draft EIS.
5. Respond to issues raised by the Tribes on the Final EIS.

## **B.2. Implementation Plan**

Providing Tribes with the opportunity to participate in the public scoping process is not the same as government-to-government consultation and coordination. The STB gave Tribal Governments an opportunity to consult at the start of the project and gave opportunities to consult prior to decision making. The STB shall ensure that additional coordination will take place as determined necessary or desirable by the Signatories and Tribes.

### **B.2.1 Completed Actions**

The STB has completed the following sequence of actions:

1. Contacted each Tribal entity (as listed in Attachment A) by telephone to confirm the name, title and address of current leadership.
2. Transmitted a Tribal Consultation Initiation letter and Consultation Questionnaire to each Tribal entity describing the EIS and government-to-government consultation and coordination process, describing the proposed project and soliciting Tribal input on potential effects of the proposed project on Tribal lands, rights, resources, religious or cultural sites and subsistence activities. The consultation questionnaire offered several options for Tribal consultation.
  - A. Face-to-face meetings with the Signatories at a Tribal facility,
  - B. Scheduled teleconferences with the Signatories,
  - C. No further involvement in government-to-government consultation during the EIS process, or
  - D. Continued receipt of project information by mail and participation through the public involvement process.
3. Conducted initial meetings or teleconferences with interested Tribes and developed an agreement and process for continued consultation and coordination throughout EIS development.
4. Documented the government-to-government coordination with each Tribe that has occurred thus far and included it in the Draft, Final EIS and Administrative Record.

### **B.2.2 Future Actions**

The STB plans the following actions to facilitate carrying out the terms of this Agreement:

1. The STB shall send all Tribes this Agreement and their ideas and preferences will be solicited concerning all parts of this Agreement that are Tribal-related. The Tribes will be able to send comments via mail, Email, or phone.



2. As appropriate, the STB shall solicit Tribal review of all identification efforts, assessments of effect, and treatment plans via mail, Email, or phone in accordance with Stipulations IV and V. of this Agreement and the list of contacts identified in Attachment A of this Agreement.
3. The STB shall notify the Tribes of meetings being held and reports being prepared in accordance with Stipulations VIII A. and B. and VIII D. of this Agreement

### **B.2.3 Native Allotments**

In 1906, the Alaska Native Allotment Act authorized the Secretary of the Interior to allot individual Alaska Natives (Native) a homestead of up to 160 acres. The Department of the Interior's (Interior) Bureau of Land Management (BLM) and Bureau of Indian Affairs (BIA) are responsible for granting rights-of-way and handling disputes between allottees and holders of rights-of-way. If the STB licenses an alternative that may directly affect a Native Allotment, the STB shall notify BLM and BIA of the decision and provide detailed maps of the proposed railroad right-of-way to ensure that the allottees are properly notified, treated with respect, and their lawful rights observed as prescribed in 25 CFR Part 169.

# **ATTACHMENT C IDENTIFICATION PLAN (ID PLAN)**

## **CULTURAL RESOURCES WORK PLAN**

### **PORT MACKENZIE RAIL EXTENSION PROJECT PORT MACKENZIE TO WILLOW, ALASKA**

Prepared for  
Surface Transportation Board  
395 E Street, S.W.  
Washington, D.C. 20423  
202-245-0245

and  
ICF International  
9300 Lee Highway  
Fairfax, Virginia 22031  
703-934-3603

5 June 2008

Stephen R. Braund & Associates  
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## **C.1. Executive Summary**

The Alaska Railroad Corporation (ARRC) intends to file a petition with the Surface Transportation Board (STB) requesting authority to construct and operate a new rail line from Matanuska-Susitna Borough's Port MacKenzie to the existing ARRC mainline between Wasilla and north of Willow in south-central Alaska. STB is the Federal agency responsible for granting authority for the construction and operation of the proposed new rail line. The Section of Environmental Analysis (SEA) is the office within the STB responsible for preparing the appropriate National Environmental Policy Act (NEPA) documentation for railroad construction and operation cases that come before the Board. SEA has issued a Notice of Intent to prepare an Environmental Impact Statement (EIS) for the Port Mackenzie Rail Extension, a draft scope of study, and a notice of scoping meetings.

STB, through ICF International (ICF), has engaged Stephen R. Braund & Associates (SRB&A) to prepare the cultural resources portion of the EIS. The EIS will identify cultural resources in the project area, evaluate the impacts of the proposed action on the cultural resources for each of the alternatives, and recommend mitigation measures, as appropriate. On March 5, 2008, SEA, ICF, ENTRIX, Inc., SRB&A, and the State Historic Preservation Office met to discuss a methodology for assessing effects to cultural resources caused by the proposed action. This cultural resources work plan is a result of that meeting and includes a brief description of the project and project area, NEPA and NHPA regulations regarding assessment of effects to cultural resources from proposed projects, consultation with parties knowledgeable about cultural resources in the proposed project area, and existing knowledge including documented cultural resources and previous surveys in the project area. The work plan also includes a description of the methods proposed for assessing effects to cultural resources from the proposed project for both the NEPA and Section 106 process.

## **C.2. List of Acronyms and Abbreviations**

ACHP	Advisory Council on Historic Preservation
ADNR	Alaska Department of Natural Resources
AHPA	Alaska Historic Preservation Act
AHRS	Alaska Heritage Resources Survey
AIRFA	American Indian Religious Freedom Act
ANCSA	Alaska Native Claims Settlement Act
APE	Area of Potential Effect
ARRC	Alaska Railroad Corporation
ARPA	Archaeological Resources Protection Act
BP	Before Present
CFR	Code of Federal Regulations
CMT	Culturally Modified Tree
DOE	Determination of Eligibility
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	Environmental Impact Statement
GIS	Geographic Information Systems
IRA	Indian Reorganization Act
MSB	Matanuska-Susitna Borough
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
OHA	Office of History and Archaeology
SEA	Section of Environmental Analysis
SHPO	State Historic Preservation Office(r)
SRB&A	Stephen R. Braund & Associates
STB	Surface Transportation Board
USGS	U.S. Geological Survey

## **C.3. Introduction**

The Alaska Railroad Corporation (ARRC) intends to file a petition with the Surface Transportation Board (STB) requesting authority to construct and operate a new rail line from Matanuska-Susitna Borough's (MSB) Port MacKenzie to the existing ARRC mainline between Wasilla and north of Willow in south-central Alaska. STB is the Federal agency responsible for granting authority for the construction and operation of the proposed new rail line. The Section of Environmental Analysis (SEA) is the office within the STB responsible for preparing the appropriate National Environmental Policy Act (NEPA) documentation for railroad construction and operation cases that come before the Board. ICF International is serving as the independent third-party consultant to SEA to assist with the NEPA review process. SEA has issued a Notice of Intent to prepare an Environmental Impact Statement (EIS) for the Port Mackenzie Rail Extension, a draft scope of study, and a notice of scoping meetings.

STB, through ICF International (ICF), has engaged Stephen R. Braund & Associates (SRB&A) to prepare the cultural resources portion of the EIS. The EIS will identify cultural resources in the project area, evaluate the impacts of the proposed action on the cultural resources for each of the alternatives, and recommend mitigation measures, as appropriate. On March 5, 2008, SEA, ICF, ENTRIX, Inc., SRB&A, and the State Historic Preservation Office (SHPO) met to discuss a methodology for assessing effects to cultural resources caused by the proposed action. This cultural resources work plan is a result of that meeting and includes a brief description of the project and project area, NEPA and National Historic Preservation Act (NHPA) regulations regarding assessment of effects to cultural resources from proposed projects, consultation with parties knowledgeable about cultural resources in the proposed project area, and existing knowledge including documented cultural resources and previous surveys in the project area. The work plan also includes a description of the methods proposed for assessing effects to cultural resources from the proposed project for both the NEPA EIS and Section 106 process.

### **C.3.1 Project Description and Area of Potential Effects**

Under NHPA, the area of potential effect (APE) includes those areas where cultural resources will be directly or indirectly affected by the proposed undertaking (36 CFR 800.16(d)). To effectively meet the obligations under Section 106 of the NHPA, which requires federal agencies to take the effects of federal undertakings on historic properties into account, the NEPA process will be coordinated with the Section 106 process as recommended at 36 CFR 800.8. Identification of cultural resources within and near the proposed route alternatives, the APE, will be conducted to assess the effects of the proposed project on cultural resources.

The proposed Port MacKenzie Rail Extension would involve the construction and operation of a new rail line connecting Port MacKenzie to a point on the ARRC main line between Wasilla and north of Willow, Alaska (Figure 1). The proposed rail line would provide freight services between the Port and Interior Alaska and would support the Port's continuing development as an intermodal and bulk material resources export and import facility. Major elements of the proposed rail extension would include between 30 and 45 miles of new railroad track; a 200-foot-wide right-of-way (100 feet on either side of the center line); crossings of local roads,

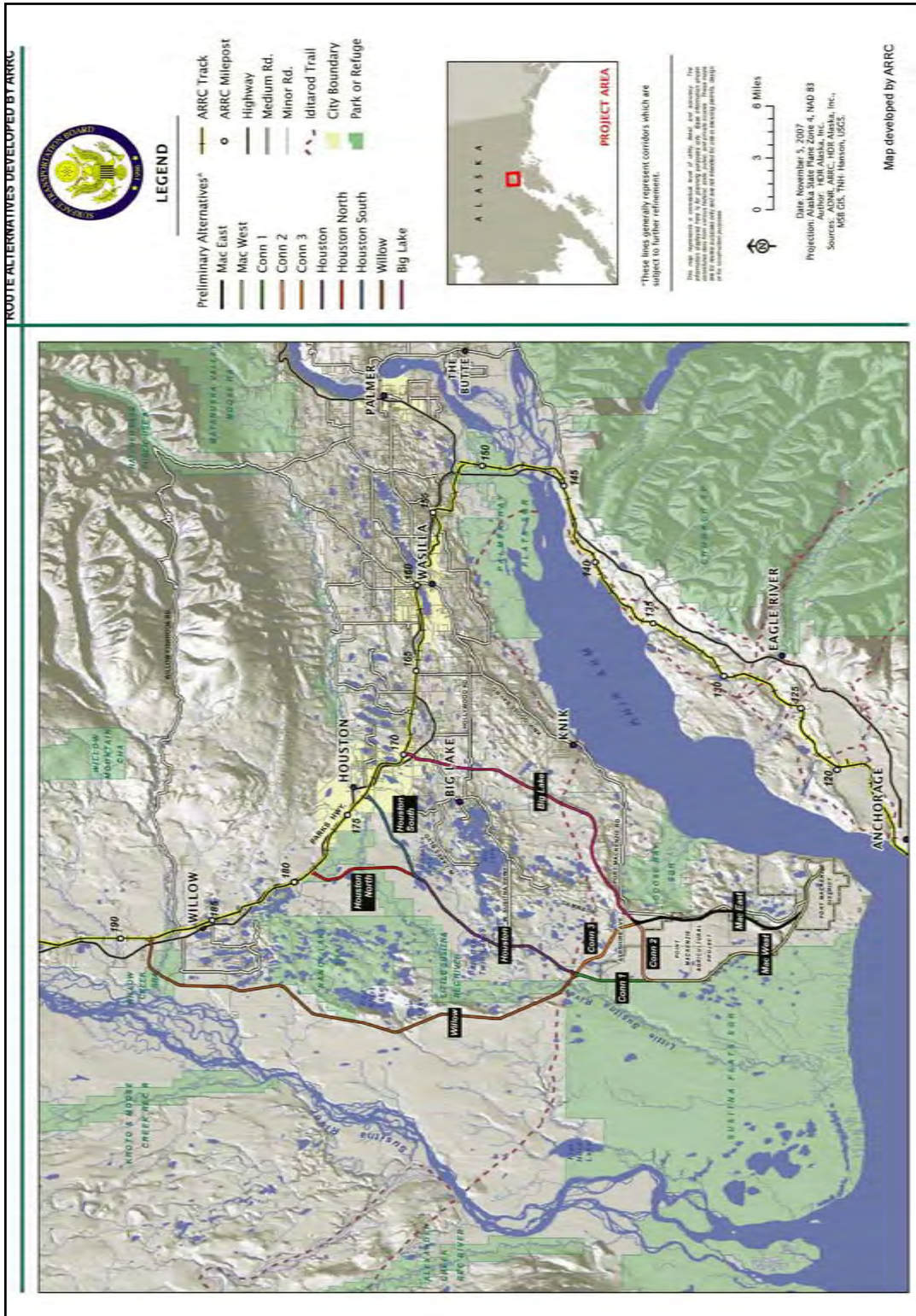


Figure 1. Port MacKenzie Rail Extension Project, Southcentral Alaska

streams, trails, and utility corridors; sidings; and ancillary facilities. The anticipated train traffic would be two trains daily on average, with one train per day traveling in each direction. The APE for direct effects would include the 200 foot wide right of way as well as areas where the ground will be disturbed such as staging areas, work camps, cut and fill areas, material sources/gravel quarries, overburden disposal areas, associated buildings/structures (e.g., sidings, bridges, etc.), and associated infrastructure (e.g., communication towers, power lines, etc.). Indirect effects could include a larger area than the 200 foot right of way.

### **C.3.2 Cultural Resources Regulations: The National Environmental Policy Act and Section 106 of the National Historic Preservation Act**

NEPA requires a review of project and program impacts on the cultural environment, which generally includes historic structures, archaeological sites, historic districts, traditional cultural properties, anthropogenic landscapes, and other culturally valued places, as well as cultural use of a biophysical environment, and sociocultural attributes (e.g., social cohesion, social institutions, lifeways, religious practices, and/or other cultural institutions).

Direct effects to cultural resources are impacts to the characteristics of a cultural resource's quality, integrity, and association (36 CFR Part 800.5; 40 CFR 1508.8). Examples of direct effects to cultural resources from construction and/or operation of the proposed facilities could include physical destruction of or damage to all or part of the resource, removal of the resource from its original location, change of the character of the resource's use or of physical features within the resource's setting that contribute to its historic significance, change in access to traditional use sites by users, or loss of cultural identity with a resource. Indirect effects to cultural resources include those impacts resulting from the action that occur later in time or further removed in distance but still reasonably foreseeable (40 CFR 1508.8). Indirect effects on cultural resources could include modifications to the visual or aesthetic setting of an NRHP-eligible property. It also includes increased access to and close proximity of project components to culturally sensitive areas. This could result in a greater vulnerability of cultural resources to damage caused by project personnel and equipment during construction and operation of facilities and infrastructure.

NEPA requires consideration of context and intensity of an impact when describing its significance (40 CFR 1508.27). Context includes the affected society (e.g., local, regional, national), the affected region, the affected interests and the setting (or locality) of the proposed action (e.g., local, regional or national). Intensity includes consideration of geographic extent of the effect (e.g., limited, local or extensive), duration (e.g., one-time, intermittent or chronic), magnitude or amount of an impact, and likelihood or probability of an impact (e.g., certain, expected or actual). In the case of cultural resources, context applies to cultural resources located within the project area. Intensity for cultural resources includes the unique qualities of the resource, such as its eligibility for or listing on the NRHP, and the cumulative aspects of project impacts.

Compliance with Section 106 of the NHPA (16 USC 470) is required by law for all federal undertakings. Section 106 outlines the process for evaluating the effects of an undertaking on

historic properties. The process involves consultation with the SHPO, the Advisory Council on Historic Preservation (ACHP), Native American tribes, and other interested parties to determine the effects of federal actions; coordinating with other reviews (e.g., NEPA, Native American Graves Protection and Repatriation Act [NAGPRA], American Indian Religious Freedom Act [AIRFA], and Archaeological Resources Protection Act [ARPA]), identifying the SHPO, tribes, and other likely consulting parties, and planning to involve the public; identifying historic properties using the Secretary of the Interior's Standards and Guidelines (as outlined in 36 CFR 800.4; National Park Service [NPS] not dated); and evaluating all historic properties for NRHP eligibility on the basis of their significance (e.g., historical, archaeological, and/or cultural; see 36 CFR 60.4). The NEPA process generally involves partial completion of the Section 106 process by initiating consultation with agencies, tribes, and stakeholders, and by identifying cultural resources in the proposed project area to the extent that potential impacts of the proposed project can be reasonably determined.

NHPA defines historic properties as prehistoric and historic districts, sites, buildings, structures, and objects listed or eligible for inclusion on the NRHP including artifacts, records, and material remains related to the property (16 USC 470w, Sec. 301.5). A determination of eligibility (DOE) for the NRHP is based on a description and evaluation of a cultural resource, a statement of significance, and a selected list of sources, maps, photographs, or other illustrations. Consideration is given to both the criteria of significance and integrity of the site condition. The evaluation considers the historic context of the property, including its relation to other known historic properties (Alaska Department of Natural Resources, Office of History and Archaeology [ADNR, OHA] 2003a). For a cultural resource (districts, sites, buildings, structures and objects) to be eligible for the NRHP, it must possess integrity of location, design, setting, materials, workmanship, feeling and/or association. The NRHP (36 CFR 60.4) outlines the criteria for determining the eligibility for a historic property as follows:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that have yielded, or may be likely to yield, information important in prehistory or history. (36 CFR 60.4)

An effect, for both Section 106 and NEPA, is when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP. The effect is considered adverse if it would impact the property in a manner that would diminish the property's integrity (location, design, setting, materials, workmanship, feeling, association) and/or its association under Criteria A-D, thus rendering it ineligible for the NRHP. There are several ways to minimize or mitigate effects to cultural resources. Mitigation under NEPA (40 CFR 1508.20), as it applies to cultural resources, involves:



- Avoiding the impact altogether by not taking a certain action or parts of an action (e.g., relocating a project component to avoid impact on an archeological site, a historic district, or an area of traditional use)
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation (e.g., altering the design of a project to reduce impacts)
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment (e.g., restoring impacted sites, landscapes, or buildings)
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- Compensating for the impact by replacing or providing substitute resources or environments (e.g., rehabilitating some buildings in exchange for demolishing others, conducting archeological data recovery or replacing areas used for cultural activities by providing access to other similar areas)

### **C.3.3 Consultation**

As part of the preliminary environmental assessment for the Port MacKenzie project, the applicant contacted the SHPO, the Knik Tribal Council, the Knik Tribal Council Cultural and Historic Preservation Committee, and the MSB Cultural Resources Office to identify potential cultural resources in the project area. Responses from these organizations are included in the preliminary environmental report (HDR Alaska, Inc. and TNH-Hanson, LLC 2008). STB published a Notice of Intent in the Federal Register on February 12, 2008 and requested scoping input from the SHPO and local tribes at that time. STB intends to conduct consultation with SHPO, appropriate tribes, and other concerned parties throughout the project. STB, ICF International, ENTRIX, Inc., SRB&A, and the SHPO met on March 5, 2008 to discuss a methodology for assessing effects to cultural resources caused by the proposed project. This cultural resources work plan is a result of that meeting.

### **C.3.4 Existing Knowledge**

There are more than 100 recorded cultural resource sites in the project area based on a preliminary review of the Alaska Heritage Resources Survey (AHRS) maintained by the ADNR, OHA (ADNR, OHA not dated). Cultural resource sites include archaeological, ethnographic, and historic sites. The project area was traditionally used by the Dena'ina, and a portion of the area is where the greatest density of Dena'ina population lived during the prehistoric and historic periods. Therefore, this is an area that is likely to encompass numerous Dena'ina cultural resource sites including villages, hunting and fishing camps, traditional locations where raw materials and subsistence resources were collected, sacred areas, and burial locations. In addition to Dena'ina uses, non-Native people used the area historically for fur farming, agriculture, homesteading, dog mushing, and recreation. One notable historic resource that would be affected by the proposed project is the Iditarod National Historic Trail, which was designated a National Historic Trail by the U.S. Congress in 1978.

There have been few cultural resource surveys conducted in the vicinity of the project area. In order to conduct a preliminary assessment of impacts to cultural resources from this project, the MSB Cultural Resources Office developed a model to predict areas of high probability for archaeological sites within the project area. Probability was based on the attributes and context of recorded sites (e.g., terrain, topography, distance to water). The probability model did not include post-twentieth century historical data on the built environment (HDR Alaska, Inc. and TNH-Hanson, LLC 2008).

#### **C.4. Methods Proposed for Assessing Effects to Cultural Resources under NEPA and Section 106**

Several types of cultural resources could be affected by the proposed Port MacKenzie Rail Extension including archaeological resources, historic structural resources, ethnographic resources, and cultural landscapes. Archaeological resources are prehistoric Native American cultural resources and historic archaeological resources of Native American and Euro-American origins. Archaeological resources that have been found, or can be expected to occur are diverse and include villages, fishing sites and weirs, hunting and gathering sites (e.g., camps, processing sites, lookouts, kill sites), collapsed log cabins, trails, horticulture sites, evidence of culturally modified trees (CMT), buried sites, major/multicomponent sites, and cemeteries or burials. Historic structural resources are standing structures that possess historic qualities, either for the people who occupied them or for the quality and integrity of workmanship. If the building has collapsed or is otherwise open to the elements, it falls into the archaeological resources category. Historic structural resources that may be found in the project area include homesteading cabins and related buildings, recreational cabins, and agricultural buildings. Ethnographic resources are tangible and intangible elements of the environment associated with cultural traditions, such as special places in the natural world, structures or sites with cultural associations, naturally occurring materials, and subsistence activities. Examples of ethnographic resources that may occur in the project area include traditional fishing and/or hunting locations, locations traditionally used for gathering materials used in utilitarian and craft items, locations associated with oral traditions, and traditionally used trails. Ethnographic resources also include traditional cultural properties. A traditional cultural property is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that are (1) rooted in that community's history, and (2) important in maintaining the continuing cultural identity of the community (Parker and King 1998). The cultural landscape is an extension of the ethnographic resource. Cultural landscapes are a geographic area, including both natural and cultural resources, associated with historic events, activities, and/or people. Landscapes are "intertwined patterns of things both natural and constructed", and are a "reflection of human adaptation and use of natural resources which are often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built" (NPS 1997). At the broadest scale, the ethnographic resource encompasses entire landscapes. During the March 5, 2008 meeting, the SHPO recommended that the assessment of cultural resources for the Port MacKenzie Rail Extension include an analysis of potential cultural landscapes for agriculture, dog mushing, and recreation in addition to the Dena'ina cultural landscape.

SRB&A proposes that the Section 106 and NEPA EIS processes for the proposed undertaking be integrated and conducted concurrently, as recommended in 36 CFR 800.8, so that information on potential impacts to cultural resources can be evaluated as part of the EIS. The following describes the proposed methodology for assessing impacts to cultural resources from the Port MacKenzie Rail Extension including methods to be used during the EIS preparation and the completion of Section 106 responsibilities.

## **C.5. NEPA Assessment of Potential Impacts**

The NEPA review will begin with a literature review and background research, including review of the AHRS maintained by ADNR, OHA (not dated); the NRHP maintained by NPS (not dated); existing archaeological, historic, and ethnographic literature for the project area; and reports regarding previous surveys in the project area. The section of the EIS that discusses the affected environment for cultural resources will include a description of known archaeological, historic, and ethnographic resources as well as cultural landscapes in the project area. In addition, the affected environment coverage will include a discussion of cultural resources likely to be found in the project area based on the probability model, as well as cultural resources found during Summer 2008 ground truthing surveys. The probability method and ground truthing survey are described below.

For the purposes of comparing potential impacts to cultural resources in the EIS, all known cultural resources within the project area will be considered potentially eligible for the NRHP unless previously determined otherwise. As described above, an adverse effect to cultural resources would be found when an undertaking would alter, directly or indirectly, any of the characteristics of that resource that would qualify the property for inclusion in the NRHP such as the resource's integrity (location, design, setting, materials, workmanship, feeling, association) and/or its association under Criteria A-D. The cultural resources environmental consequences chapter in the EIS will include an assessment of direct and indirect affects to known cultural resources for each proposed project alternative. The environmental consequences chapter will also include a comparison of effects on cultural resources by alternative based on probability modeling, including ground truthing field work, described below.

The EIS will also include cumulative effects to cultural resources (known and planned) from the proposed action and mitigation measures for addressing adverse effects to cultural resources from the proposed project.

### **C.5.1 Probability Methodology**

A probability method for predicting the presence or absence of cultural resources was recently developed for the project area by the MSB Cultural Resources Division Planning and Land Use Department (HDR Alaska, Inc. and TNH-Hanson, LLC 2008). This probability methodology – or predictive modeling – can be used to guide where focused cultural resource investigations should be conducted prior to ground disturbing activity. In addition, predictive modeling can be used to compare effects to cultural resources from proposed alternatives during the NEPA process. For the Port MacKenzie Rail Extension Project, SRB&A will tier off of the MSB

probability model. The current model focuses on the probability of prehistoric archaeological sites, but SRB&A will revise the model to add the probability for encountering historic sites. The MSB Cultural Resources office recommended field surveys prior to construction for areas identified as high probability for containing archaeological sites and included emphasis on the following features:

- confluence of a river with a lake,
- confluence of two rivers,
- bluffs above major waterways,
- promontories that may have provided good lookouts for prehistoric camps,
- promontories near or adjacent to swamps where waterfowl might have congregated, and
- bluffs surrounding inland lakes and streams (HDR Alaska, Inc. and TNH-Hanson, LLC 2008).

SRB&A suggests four levels of probability based on archaeological, ethnographic and historic information; known cultural resource site location information; topographic feature distributions; and other resource distribution data. These four levels of probability include:

1. **Known Site Location:** Includes a small area around identified sites, features, or artifact finds. Activities represented by sites/features/artifacts are rarely confined to the physical limits of a feature.
2. **High Probability:** Indicated by proximity to where clear water streams enter silty rivers, high ground near an important resource, proximity to travelways (trails/streams), high prominences above surrounding terrain usable as lookouts for game, bluffs above major waterways as well as lakes and streams, inlets or outlets of lakes, confluences of two rivers/streams or a river/stream with a lake, proximity to Euroamerican settlements, and areas where remains have been reported but have not been confirmed.
3. **Medium Probability:** Includes areas with some prospect of finding cultural resources but less likelihood than high probability areas such as along high river banks, dry land with no topographic prominence relative to the surrounding terrain, topographic prominences away from the rivers, and high dry banks along the shores of lakes.
4. **Low Probability:** Includes swampy areas, intertidal marshes, very recent geological features such as active river floodplain or islands, areas with steep inclines, areas where previous ground surface and subsurface has been destroyed or heavily disturbed and/or culture bearing soils have been removed, dry lake or stream beds, bare bedrock outcrops, areas previously surveyed with negative results, areas known to have no historic significance, and areas determined not suitable for occupation or where there is a low potential for site preservation.

SRB&A will create a Geographic Information Systems (GIS) probability model for the proposed project area based on archaeological, ethnographic and historic information; known cultural resource sites; the MSB probability model; topography; and hydrography. This GIS probability model will help to refine the four probability levels described above and will be used to create a map that will be used to choose possible survey locations for the ground truthing survey. The

GIS probability model will only evaluate areas within one mile of proposed project alternatives. The study area will be divided into 100-meter squares and scored based on the following criteria:

- within 500 feet of an AHRS or other cultural resource site (+1)
- designated as a high probability area for cultural resources by MSB (+1)
- within one mile of the coast (+1)
- within one-quarter mile of a river, stream, or lake (+1)
- a surficial geology type of any of the following (+1):
  - moraines and other unsorted glacial drift
  - proglacial lake and associated fluvial deposit
  - sand dune and other eolian deposit
- previous survey data by section:
  - positive survey (+1)
  - negative survey (-1)
  - no survey (0)

Based on the above scoring method used in the GIS probability model, which was informed by the four probability levels described above, each 100-meter square could receive a maximum score of six. If the 100-meter square's end score was a four through six, SRB&A would designate it as high probability. If the 100-meter square's end score was a two or three, SRB&A would designate it as medium probability. If the 100-meter square's end score was a one, SRB&A would designate it as low probability. If the 100-meter square's end score was a zero or negative one, SRB&A would remove it from further consideration. SRB&A will use the results of the probability method to create a map that will be used to choose possible locations for the ground truthing survey and to assess the various route alternatives.

## **C.5.2 Ground Truthing Survey**

Based on the probability method described above, SRB&A would conduct ground truthing surveys in the project area. A sample of each proposed alternative would be surveyed, with survey efforts concentrated in areas determined to be high or medium probability for cultural resources. Ground truthing would include a pedestrian survey along transects determined by ground conditions, as well as the excavation of test units in high and/or medium probability areas. To the extent possible, the cultural resources ground truthing survey will be coordinated with other field studies conducted for the EIS during Summer 2008. Following completion of the ground truthing field effort, a report describing the probability method, ground truthing survey methods and results will be submitted to SHPO. The SHPO will have a minimum of 30 days to review and respond to this report. The ground truthing survey will help to further refine the probability method that will be used for the Section 106 assessment.

## **C.6. Completion of the Section 106 Process**

Following completion of the EIS process and STB's choice of an alternative for construction, the Section 106 assessment of cultural resources will be completed. The completion of Section 106 responsibilities is expected to be guided by a programmatic agreement (PA) developed for the

Port MacKenzie project, with all fieldwork, reporting, and approvals obtained prior to construction. This phase of analysis will tier off of the data collected for the EIS, which included a review of the AHRS maintained by ADNR, OHA; the NRHP maintained by NPS; existing archaeological, historic, and ethnographic literature for the project area; and reports regarding previous surveys in the project area, and included the application and ground truthing of the probability method for the route alternatives. This phase of the work will include consultation with SHPO, appropriate Native organizations, user groups (e.g., dog mushers, farmers, snow machiners, recreationists, etc.) and other knowledgeable parties (e.g., the Matanuska-Susitna Borough, Bureau of Land Management, Alaska Division of Parks and Outdoor Recreation, etc.) regarding cultural resources and cultural landscapes in the project area for the alternative chosen for construction at the close of the NEPA process.

This phase of analysis will include a pedestrian survey and subsurface testing of the APE for the selected (preferred) route alternative prior to any ground disturbing activities, whereas only a sample of each proposed alternative would be surveyed as part of ground truthing during the NEPA process. These survey efforts will be concentrated in areas not surveyed during the ground truthing surveys that are determined to be high or medium probability for cultural resources. If any significant cultural resource is identified, a determination of eligibility for the NRHP will be completed and submitted as part of the final report. The final report will include a description of the project, APE, and environment in the project area. The report will also include a description, based on a review of available literature, AHRS and NRHP, of known cultural resources and previous cultural investigations in the project area; a description of the prehistory, ethnography, and history of the project area; a description of cultural landscapes in the project area; a description of consultation methods and results; a description of field survey methods and results; determinations of eligibility for cultural resources that will be affected by the proposed project; completed AHRS forms for any cultural resources identified during the field survey; and recommendations based on the results of the archival and literature review, cultural resource compliance surveys and consultation. This report will be submitted to STB who will submit it to SHPO for their review and concurrence. The SHPO will have a minimum of 30 days to review and respond to this report. Ground disturbing activities may not start until SHPO has completed its review and concurred with STB's findings regarding the proposed project's effect on historic properties.

## **C.7. Summary and Recommendations**

Cultural resource assessments associated with the proposed Port MacKenzie Rail Extension project, a federal undertaking, would involve an integrated process for satisfying NEPA and Section 106. The NEPA documentation would include a description of the affected environment, based on predictive modeling, with a description of direct, indirect, and cumulative effects from the proposed project on cultural resources. This level of analysis would provide an effective means for comparing the potential impacts of different project alternatives and provide mitigation strategies for addressing adverse impacts to cultural resources from the proposed project. As part of the NEPA process, a ground truthing survey will be conducted in Summer 2008. The ground truthing survey will focus on a sample of areas with high and/or medium potential for cultural resources for all proposed project alternatives. A report describing the probability method, ground truthing survey method and survey results will be submitted to

SHPO following completion of the surveys. The results will be the basis for the EIS chapters on affected environment and environmental consequences. The subsequent completion of the Section 106 assessment will include a review of available information regarding cultural resources, consultation, field surveys with subsurface testing in areas not surveyed during ground truthing, and determinations of eligibility for the NRHP for any cultural resource that could be affected by the proposed project. This report will be submitted to SHPO for their review and concurrence prior to the start of any project construction.

SRB&A recommends that Native organizations be invited to participate in the ground truthing and Section 106 surveys and be allowed to review documents regarding cultural resources prior to submittal to STB. SRB&A recommends that STB, in cooperation with SHPO, create a Draft Programmatic Agreement to outline methods to assess impacts to cultural resources from the proposed project. This Draft Programmatic Agreement would be included in the EIS. Because all proposed alternatives would likely affect the Iditarod National Historic Trail, SRB&A also recommends that STB, in cooperation with SHPO and BLM, compose a Memorandum of Agreement to outline mitigation strategies for impacts to the Iditarod National Historic Trail from the proposed project.

**APPENDIX K**  
**NOISE AND VIBRATION IMPACTS**  
**ASSESSMENT METHODOLOGY**



## K. NOISE AND VIBRATION

This appendix describes the methods the Surface Transportation Board's Section of Environmental Analysis (SEA) used to model the potential effects of noise and vibration from construction and operation of the proposed Port MacKenzie Rail Extension.

### K.1 Wayside Noise Model Methodology

Wayside noise collectively refers to noise generated by railcars and locomotives (that is, without including horn noise). SEA used noise measurements from past noise studies, including the *Final Environmental Impact Statement for the Conrail Acquisition* (STB, 1998a) and *Draft Environmental Assessment for the Canadian National/Illinois Central Acquisition Environmental Assessment* (STB, 1998b), as the basis for the wayside noise level projections for the Port MacKenzie Rail Extension project.

The basic equation used for the wayside noise model is:

$$SEL_{cars} = L_{eqref} + 10\log(T_{passby}) + 30\log(S/S_{ref})$$

For locomotives, which can be modeled as moving monopole point sources, the corresponding equation is as follows:

$$SEL_{locos} = SEL_{ref} + 10\log(N_{locos}) - 10\log(S/S_{ref})$$

The total train sound exposure level is computed by logarithmically adding  $SEL_{locos}$  and  $SEL_{cars}$

$$\begin{aligned} DNL_{100'} &= SEL + 10\log(N_d + 10*N_n) - 49.4 \\ DNL &= DNL_{100'} + 15\log(100/D) \end{aligned}$$

The parameters that apply to the equations above are:

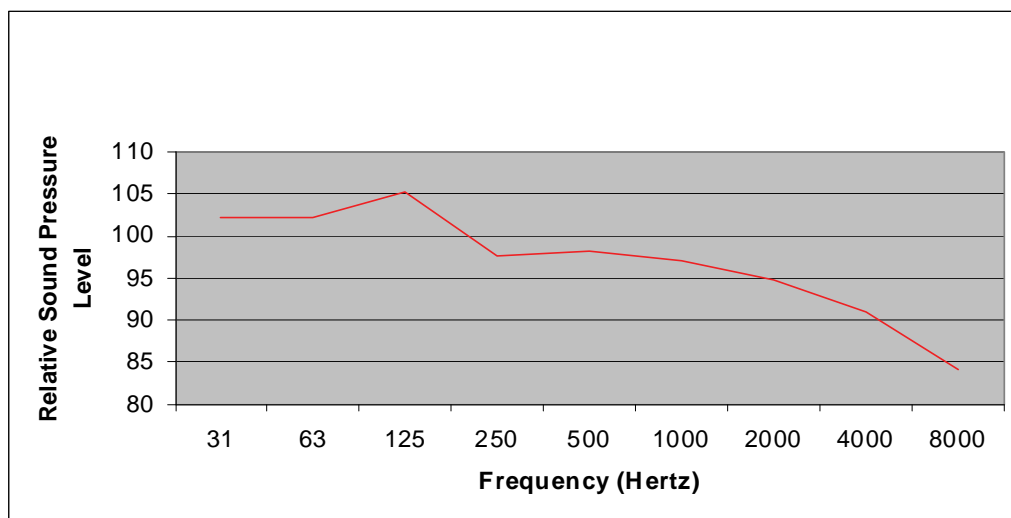
$SEL_{cars}$  = Sound Exposure Level of railcars  
 $L_{eqref}$  = Level Equivalent of railcar  
 $T_{passby}$  = Train passby time, in seconds  
 $S$  = Train speed, in miles per hour  
 $S_{ref}$  = Reference train speed  
 $SEL_{locos}$  = Sound Exposure Level of locomotive  
 $SEL_{ref}$  = Reference Sound Exposure Level of locomotive  
 $DNL$  = Day-night average noise level  
 $N_{locos}$  = Number of locomotives  
 $N_d$  = Number of trains during daytime  
 $N_n$  = Number of trains during nighttime  
 $D$  = Distance from tracks, in feet

Table K-1 shows the reference wayside noise levels used in this study and Figure K-1 shows the wayside noise frequency spectrum used in the calculations.

**Table K-1**  
**Reference Wayside Noise Levels**

Description	Average Level (dBA) <sup>a</sup>
Locomotive SEL <sup>b</sup> (40 miles per hour at 100 feet) <sup>c</sup>	95
Railcar L <sub>eq</sub> <sup>d,e</sup>	82

<sup>a</sup> dBA = A-weighted decibels.  
<sup>b</sup> SEL = sound exposure level.  
<sup>c</sup> Source: STB, 1998a.  
<sup>d</sup> L<sub>eq</sub> = level equivalent.  
<sup>e</sup> Source: STB, 1998b.



**Figure K-1. Wayside Noise Spectrum**  
**(STB, 2002)**

## K.2 Horn Noise Model Methodology

Freight train horn noise levels can vary for a variety of reasons, including the manner in which an engineer sounds the horn. Consequently, it is important to base horn noise reference levels on a large sample size. A substantial amount of horn noise data are available from the *Draft Environmental Impact Statement, Proposed Rule for the Use of Locomotive Horns at Highway-Rail Grade Crossings* (FRA, 1999), hereinafter referred to as the 1999 Federal Railroad Administration Draft Environmental Impact Statement (EIS).

Federal Railroad Administration (FRA) data indicate that horn noise levels increase from the point at which the horn is sounded 0.40 kilometer (0.25 mile) from the grade crossing to when it stops sounding at the grade crossing. In the first 0.201 kilometer (0.125 mile) segment, the energy average sound exposure level measured at a distance of 30 meters (100 feet) from the tracks was found to be 107 dBA and 110 dBA in the second 0.201 kilometer (0.125 mile) segment. The 1999 FRA Draft EIS simplified the horn noise contour shape as a five-sided polygon, when it is actually a teardrop shape. The *Final Environmental Impact Statement, Construction and Operation of a Rail Line from the Bayport Loop in Harris County, Texas* (STB, 2003) discusses this subject in detail. SEA used the more accurate teardrop horn noise

contour shape for this analysis. The attenuation or drop-off rate of horn noise is assumed to be 4.5 dBA per doubling of distance away from the tracks (FRA, 1999).

Table K-2 lists the reference horn noise levels used in this study, and Figure K-2 shows the horn noise spectrum used in the calculations.

Table K-2 Reference Horn Noise Levels	
Description	Average Level (dBA) <sup>a</sup>
Horn SEL <sup>b</sup> 1st 0.25 mile <sup>c</sup>	110
Horn SEL 2nd 0.25 mile <sup>c</sup>	107
<sup>a</sup> dBA = A-weighted decibels.	
<sup>b</sup> SEL = sound exposure level.	
<sup>c</sup> Source: FRA, 1999.	

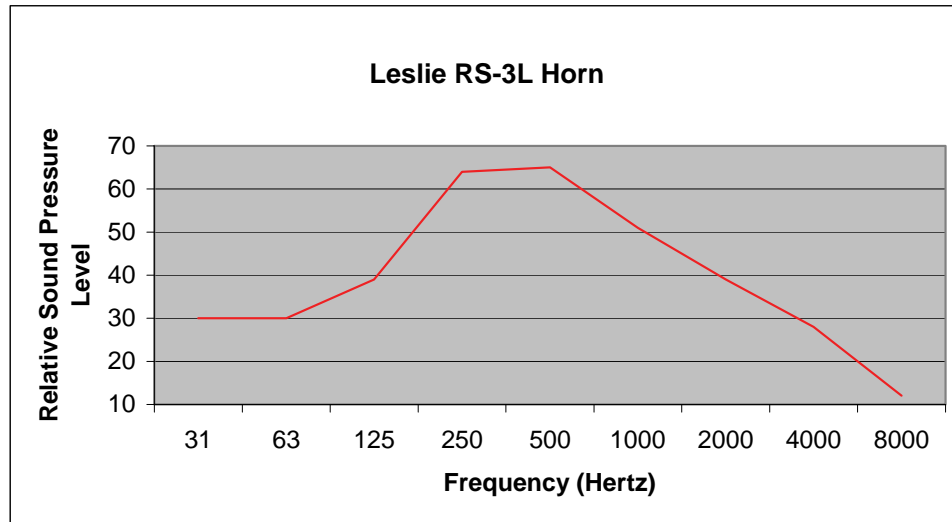


Figure K-2. Horn Noise Spectrum  
(STB, 2002)

### K.3 Rail Line Operations Vibration Analysis Methodology

SEA based the vibration methodology on Federal Transit Administration (FTA) methods (*Transit Noise and Vibration Impact Assessment, Federal Transit Administration [FTA, 2006]*). Vibration level due to train passbys is approximately proportional to:

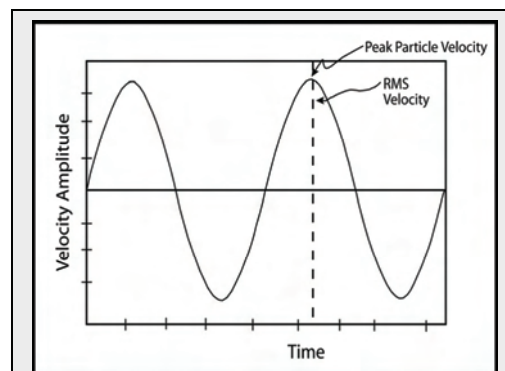
$$V = 20 \times \log (\text{speed}/\text{speed}_{\text{ref}})$$

Where

- V is the ground-borne vibration velocity.
- speed is the train speed.
- speed<sub>ref</sub> is the reference speed of the train relative to its corresponding vibration level.

Published (FTA) ground-borne vibration levels are adjusted for train speed by this equation and distance from the rail line to estimate vibration levels at receptor locations.

There are two ground-vibration impacts of general concern: annoyance to humans and damage to buildings. In special cases, activities that are highly sensitive to vibration, such as micro-electronics fabrication facilities, are evaluated separately. There are two measurements corresponding to human annoyance and building damage for evaluating ground vibration – peak particle velocity (PPV) and root-mean square (RMS) velocity. PPV is the maximum instantaneous positive or negative peak of the vibration signal, measured as a distance per time (such as millimeters or inches per second). This measurement has been used historically to evaluate shock-wave type vibrations from actions like blasting, pile driving, and mining activities, and their relationship to building damage. RMS is an average, or smoothed, vibration amplitude, commonly measured over 1-second intervals. It is expressed on a log scale in decibels (VdB) referenced to  $0.000001 \times 10^{-6}$  inch per second and is not to be confused with noise decibels. It is more suitable for addressing human annoyance and characterizing background vibration conditions because it better represents the response time of humans to ground vibration signals.



**Peak particle velocity (PPV):** instantaneous positive or negative peak of a vibration signal, measured as a distance per time.

**Root-mean-square (RMS) velocity (VdB)** is a measure of ground vibration in decibels used to compare vibration from various sources.

## K.4 Construction Noise and Vibration Analysis Methodology

SEA based the construction noise impact assessment on FTA methods (*Transit Noise and Vibration Impact Assessment, Federal Transit Administration* [FTA, 2006]) General Assessment construction noise guidelines, shown in Table K-3.

**Table K-3**  
**Federal Transit Administration General**  
**Assessment Construction Noise Guidelines**

Land Use	1-hour $L_{eq}$ (dBA) <sup>a</sup>	
	Day	Night
Residential	90	80
Commercial	100	100
Industrial	100	100

<sup>a</sup>  $L_{eq}$  = level equivalent; dBA = A-weighted decibels.

The FTA General Assessment for construction noise is used when details of the construction schedule are not known. The method calls for estimating combined noise levels from the two noisiest pieces of construction equipment and determining locations which would exceed the noise guidelines in Table K-3.

Construction vibration levels are estimated according to the following equation:

$$PPV_{\text{equipment}} = PPV_{\text{ref}} \times (25/D)^{1.5}$$

Where

- $PPV_{\text{equipment}}$  is the peak particle velocity in in/sec of the equipment adjusted for distance.
- $PPV_{\text{ref}}$  is the reference vibration level in in/sec at 25 feet.
- D is the distance from the equipment to the receptor.

Estimated construction vibration levels are then compared with building damage criterion.

## **K.5 References**

- FRA (Federal Railroad Administration). 1999. Draft Environmental Impact Statement, Proposed Rule for the Use of Locomotive Horns at Highway-Rail Grade Crossings.
- FTA (Federal Transit Administration). 2006. Transit Noise and Vibration Assessment. (FTA-VA-90-1003-06.) May.
- STB (Surface Transportation Board). 2003. Final Environmental Impact Statement, Construction and Operation of a Rail Line from the Bayport Loop in Harris County, Texas. May.
- STB. 2002. Draft Environmental Impact Statement, Construction and Operation of a Rail Line from the Bayport Loop in Harris County, Texas. December.
- STB. 1998a. Final Environmental Impact Statement No. 980194, Conrail Acquisition (Finance Docket No. 33388) by CSX Corporation and CSX Transportation Inc., and Norfolk Southern Corporation and Norfolk Southern Railway Company (NS). July.
- STB. 1998b. Draft Environmental Assessment Canadian National/Illinois Central Railroad Acquisition. December.

## K.6 Glossary

Ambient noise	The sum of all noise (from human and naturally occurring sources) at a specific location over a specific time is called ambient noise.
Day-night average sound level	The energy average of <b>A-weighted decibel</b> sound levels over 24 hours, which includes a 10 decibel adjustment factor for noise between 10 p.m. and 7 a.m. to account for the greater sensitivity of most people to noise during the night. The effect of nighttime adjustment is that one nighttime event, such as a train passing by between 10 p.m. and 7 a.m., is equivalent to 10 similar events during the daytime.
Decibel (dB)	A standard unit for measuring sound pressure levels based on a reference sound pressure of 0.0002 dyne per square centimeter. This is nominally the lowest sound pressure that people can hear.
Decibel, A-weighted (dBA)	A measure of noise level used to compare noise from various sources. A-weighting approximates the frequency response of the human ear.
Hertz (Hz)	A unit of frequency equal to one cycle per second.
Peak particle velocity (PPV)	The maximum instantaneous positive or negative peak of the vibration signal, measured as a distance per unit time (such as millimeters or inches per second). This measurement has been used historically to evaluate shock-wave type vibrations from actions like blasting, pile driving, and mining activities, and their relationship to building damage.
Root-mean-square vibration velocity (VdB)	An average or smoothed vibration amplitude, commonly measured over 1-second intervals. It is expressed on a log scale in decibels (VdB) referenced to 0.000001 inch per second and is not to be confused with noise <i>decibels</i> .

## **APPENDIX L**

### **GRADE CROSSING SAFETY AND DELAY ANALYSIS**



## **L. GRADE CROSSING SAFETY AND DELAY ANALYSIS METHODOLOGY**

### **L.1 Grade Crossing Safety Analysis Methodology**

#### **L.1.1 Assumptions for Calculations**

The Surface Transportation Board's Section of Environmental Analysis (SEA) used several data sources to characterize grade crossing safety conditions, as follows:

- Information on current and future rail traffic from the Alaska Railroad Corporation (ARRC or the Applicant), as described in Chapter 2
- The Federal Railroad Administration (FRA) *Highway-Rail Crossing Inventory* for information on road and train traffic characteristics at highway/rail crossings, including the number of tracks, number of road lanes, warning devices, daily vehicle traffic volume, road paving, road classifications, and the most recent 5 years of accident history (FRA, 2007a)
- Available information on annual average daily traffic (AADT) from the Alaska Department of Transportation & Public Facilities 2005 traffic map and the Matanuska-Susitna Borough 2006 traffic map (taken from ARRC, 2008a). Where AADT was not available from agency traffic maps, aerial photography was used to identify land usage and structures. AADT values for 2012 were estimated using the available data and an annual growth rate of 0.6 percent (CDTC, 2004)
- The FRA Personal Computer Accident Prediction System to predict accident frequencies at existing grade crossings (FRA, 2007b)
- The ARRC initial estimate of train traffic of 2 trains per day (ARRC, 2008b)

#### **L.1.2 Calculation of Accident Frequency**

SEA analyzed traffic safety at existing public at-grade highway/rail crossings using the accident history from the past 5 years and calculated the potential change in the predicted accident frequency (accidents per year) resulting from the proposed action alternatives that would involve use of all or part of the existing ARRC main line between Willow and Wasilla. This calculation involved information on public at-grade crossings provided in the FRA *National Highway-Rail Crossing Inventory* (FRA, 2007a), with the exception of anticipated future train traffic and AADT information, which SEA obtained from the sources indicated above. SEA performed the calculation of predicted accident frequency using the FRA Personal Computer Accident Prediction System.

#### **L.1.3 Calculation of Hazard Index**

For new at-grade crossings that could result from the proposed action, SEA analyzed safety using a hazard index, rather than predicted accident frequency, because the predicted accident frequency approach requires historical data on past accidents at a crossing. In addition, to

provide for comparable comparison of the alternatives, SEA also calculated a hazard index for existing at-grade crossings on the main line that could be used by rail traffic on some alternatives for the proposed rail line. SEA calculated a hazard index for each crossing using the New Hampshire Method as the product of the roadway AADT, trains per day, and a crossing protection factor. The latter is defined as 1.00 for crossbuck signage, 0.90 for crossbucks with stop signs, 0.20 for crossbucks with automatic flashers, 0.11 for crossbucks with automatic flashers and gates, and zero for grade-separated crossings. Table L-1 lists calculations at each crossing.

## **L.2 Grade Crossing Delay Analysis Methodology**

For each at-grade crossing analyzed, SEA calculated the time that a particular crossing would be blocked for each train-crossing event and estimated the average delay per vehicle at that crossing in a 24-hour period. SEA used the average delay per vehicle for at-grade crossings to determine the level of service. Level of service is also used as a qualitative measure of road and intersection operating conditions. SEA also estimated the average traffic delays for all vehicles over a 24-hour period and used the average delay per vehicle to determine level of service for each at-grade crossing based on ratings listed in Table L-2.

SEA used the following calculations to estimate traffic delay for at-grade crossings. The traffic delay at a crossing includes the time for the train to pass, and the time for any warning device to engage and disengage. For simplification purposes, it is assumed that both rail and road traffic would be uniform throughout the day.

The first step includes the calculation of gate-down time per train event (T).

$$T = T_w + \frac{L}{V}$$

Where:

$T_w$  = Gate warning time  
 $L$  = Average train length  
 $V$  = Average train speed

The number of stopped vehicles delayed per day ( $N_v$ ) can be calculated as follows:

$$N_v = \frac{T}{24} * N * ADT$$

Where:

$N$  = Number of trains per day  
 $ADT$  = Average daily traffic<sup>1</sup>  
 $24$  = Hours per day

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<sup>1</sup> Also referred to as annual average daily traffic (AADT).

**Table L-1**  
**Hazard Index Calculations for the Build Alternatives (page 1 of 2)**

Segment	Mile Post	Road Name	Type of Crossing	Type of Protection	2012 AADT	Date of Traffic Count
Mac West	MW 5.7	S. Guernsey Road	At-Grade	Crossbucks	<100	Estimated
Mac East	ME 4.9	Baker Farm Road	Separated	RR over Hwy	<100	Estimated
	ME 9.8	W. Holstein Avenue	Separated	RR over Hwy	<100	Estimated
Conn 1	C1-2.4	Little Su River Road	At-Grade	Crossbucks	148	2005
Conn 2	C2-2.3	S. Guernsey Road	At-Grade	Crossbucks	<100	Estimated
Conn 3	C3-0.7	Ayrshire Avenue	At-Grade	Flashing Lights/Gates	555	2005
	C3-1.0	W. Carpenter Lake Road	At-Grade	Crossbucks	56	2005
Willow	W 19.8	W. Deshka Landing Road	At-Grade	Crossbucks	159	2005
	W 23.4	Willow Creek Parkway	At-Grade	Crossbucks	380	2005
	W 25.9	Parks Highway	Separated	Hwy over RR	NA	NA
Houston	H 3.3	W. Susitna Parkway	At-Grade	Crossbucks	352	2007
	H 4.0	W. Papoose Twins Road	At-Grade	Crossbucks	157	2005
Houston South Big Lake	HS 5.0	W. Millers Reach Road	At-Grade	Crossbucks	<150	Estimated
	B 0.8	S. Burma Road	At-Grade	Flashing Lights/Gates	611	2005
	B 3.2	Homestead Road	At-Grade	Crossbucks	<100	Estimated
	B 5.0	Homestead Road	At-Grade	Crossbucks	<100	Estimated
	B 11.1	S. Larrys Lane	At-Grade	Crossbucks	<100	Estimated
	B 14.0	W. Hollywood Road	Separated	Hwy over RR	1426	2005
	B 15.8	W. Big Lake Road	Separated	RR over Hwy	NA	NA
	B 16.4	W. Calonder Way	At-Grade	Crossbucks	<50	Estimated
	B 16.7	W. Larae Road	At-Grade	Crossbucks	<100	Estimated
	B 17.1	Parks Highway	Separated	Hwy over RR	NA	NA
	171.3	Cheri Lake Drive	At-Grade	Flashing Lights/Gates	<200	Estimated
	173.0	Parks Highway	Separated	RR over Hwy	NA	2006
Existing ARRC Main Line	180.0	N. Lynx Lake Road	At-Grade	Crossbucks/Stop Signs	<100	Estimated
	180.8	W. Twitty Avenue / Nancy Lake Landing	At-Grade	Crossbucks/Stop Signs	<100	Estimated
	182.6	Parks Highway	Separated	RR over Hwy	NA	2006
	185.5	Willow Station Road	At-Grade	Flashing Lights/Gates	395	2005
	186.9	Willow Fishhook Road	At-Grade	Flashing Lights/Gates	710	2005

**Table L-1**  
**Hazard Index Calculations for the Build Alternatives (page 2 of 2)**

Segment	Build Alternatives <sup>a</sup>															
	Mac West, Conn 1, Willow				Mac West, Conn 1, Houston, Houston South				Mac West, Conn 2, Big Lake				Mac East, Conn 3, Willow			
	PF	HI	PF	HI	PF	HI	PF	HI	PF	HI	PF	HI	PF	HI	PF	HI
Mac West	1.0	205	1	205	1	205	1	205	1	205	1	205	NA	NA	NA	NA
Mac East	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
Conn 1	1.0	309	1	309	1	309	1	309	NA	NA	NA	NA	NA	NA	NA	NA
Conn 2	NA	NA	NA	NA	NA	NA	NA	NA	1	205	NA	NA	NA	NA	NA	NA
Conn 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.11	127	0.11	127	0.11	127
	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	117	1	117	1	117
Willow	1.0	332	NA	NA	NA	NA	NA	NA	NA	NA	1	332	NA	NA	NA	NA
	1.0	793	NA	NA	NA	NA	NA	NA	NA	NA	1	793	NA	NA	NA	NA
	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	NA	NA
Houston	NA	NA	1	725	1	725	1	725	NA	NA	NA	NA	1	725	1	725
	NA	NA	1	327	1	327	1	327	NA	NA	NA	NA	1	327	1	327
Houston South	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Big Lake	NA	NA	NA	NA	NA	NA	NA	NA	0.11	140	NA	NA	NA	NA	NA	0.11
	NA	NA	NA	NA	NA	NA	NA	NA	1	205	NA	NA	NA	NA	NA	1
	NA	NA	NA	NA	NA	NA	NA	NA	1	205	NA	NA	NA	NA	NA	1
	NA	NA	NA	NA	NA	NA	NA	NA	1	205	NA	NA	NA	NA	NA	1
	NA	NA	NA	NA	NA	NA	NA	NA	0	0	NA	NA	NA	NA	NA	0
	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	NA	NA	NA	0
	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	NA	NA	NA	0
	NA	NA	NA	NA	NA	NA	NA	NA	1	102	NA	NA	NA	NA	NA	1
	NA	NA	NA	NA	NA	NA	NA	NA	1	205	NA	NA	NA	NA	NA	1
	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	NA	NA	NA	0
	NA	NA	NA	NA	NA	NA	NA	NA	0.11	45	NA	NA	NA	NA	NA	0.11
	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	NA	NA	NA	0
	NA	NA	0.9	184	0.9	184	0.9	184	0.9	184	NA	NA	0.9	184	0.9	184
	NA	NA	0.9	184	0.9	184	0.9	184	0.9	184	NA	NA	0.9	184	0.9	184
	NA	NA	0	NA	0	NA	0	NA	0	NA	NA	NA	0	NA	0	NA
	NA	NA	0.11	91	0.11	91	0.11	91	0.11	91	NA	NA	0.11	91	0.11	91
	NA	NA	0.11	163	0.11	163	0.11	163	0.11	163	NA	NA	0.11	163	0.11	163
		1638		2189		2496		2139		1368		1919		2226		1729
Hazard Index:																
Number of At Grade Crossings:	4	8	9	13	5	3										
Number of Separated Crossings:	1	1	1	5	3											

<sup>a</sup>PF = Crossing Protection Factor; HI = Hazard Index

**Table L-2**  
**Grade Crossings Level of Service<sup>a</sup>**

<b>Level of Service</b>	<b>Average Total Delay (seconds per vehicle)</b>
A	<= 10
B	> 10 and <= 20
C	> 20 and <= 35
D	> 35 and <= 55
E	> 55 and <= 80
F	> 80
<sup>a</sup> Source: Transportation Research Board, 2001	

The average delay per vehicle in a 24-hour period ( $D_V$ ) is:

$$D_V = \frac{N_V}{ADT} * \frac{T * \frac{R_D}{R_D - R_A}}{2}$$

Where:

$R_D$  = Departure rate (vehicles/lane/hour)<sup>2</sup>

$R_A$  = Arrival rate, average daily traffic converted to vehicles/lane-hour

2 = Denominator to reflect that vehicles do not experience the entire time the train is blocking the grade crossing. They are assumed to arrive on average at the midpoint of the train crossing period.

Total vehicle delay ( $D$ ) is the product of average delay per vehicle ( $D_V$ ) and the average daily traffic ( $ADT$ ).

$$D = D_V * ADT$$

Table L-3 lists the results of the grade crossing delay analysis for the proposed action.

<sup>2</sup> Based on the *Highway Capacity Manual* (Transportation Research Board, 2001), departure rates (in vehicles/lane-hour) are the following: highways (1,800), arterials (1,400), collectors (900), and local roads (700).

**Table L-3**  
**Delay at At-Grade Highway/Rail Crossings**

Segment	Crossing ID	Street	Average Daily Traffic in Both Directions (Veh/Day)	Number of Daily Trains (including loaded and empty)			Number of Vehicles Delayed Per Day (vehicles/day)			Average Delay Per Stopped Vehicle (min/vehicle)			Average Delay Per Vehicle in a 24-Hour Period (sec/vehicle)			Total Delay in a 24-Hour Period (min)		
				No Action	Pro-posed Action	Pro-posed Action	No Action	Pro-posed Action	Pro-posed Action	No Action	Pro-posed Action	Pro-posed Action	No Action	Pro-posed Action	Pro-posed Action	No Action	Pro-posed Action	Pro-posed Action
Mac West	MW 5.7	S. Guernsey Road	102	-	2.0	-	0.3	-	1.0	-	2.0	-	2.0	-	2.0	-	0.3	-
Conn 1	C1-2.4	Little Su River Road	154	-	2.0	-	0.4	-	1.0	-	2.0	-	2.0	-	2.0	-	0.4	-
Conn 2	C2-2.3	S. Guernsey Road	102	-	2.0	-	0.3	-	1.0	-	2.0	-	2.0	-	2.0	-	0.3	-
Conn 3	C3-0.7	Ayrshire Avenue	579	-	2.0	-	1.5	-	1.0	-	2.0	-	2.0	-	2.0	-	1.5	-
	C3-1.0	W. Carpenter Lake Road	58	-	2.0	-	0.2	-	1.0	-	2.0	-	2.0	-	2.0	-	0.2	-
Willow	W 19.8	W. Deshka Landing Road	166	-	2.0	-	0.4	-	1.0	-	2.0	-	2.0	-	2.0	-	0.4	-
	W 23.4	Willow Creek Parkway	396	-	2.0	-	1.1	-	1.0	-	2.0	-	2.0	-	2.0	-	1.0	-
Houston	H 3.3	W. Susitna Parkway	363	-	2.0	-	1.0	-	1.0	-	2.0	-	2.0	-	2.0	-	0.9	-
	H 4.0	W. Papoose Twins Road	164	-	2.0	-	0.4	-	1.0	-	2.0	-	2.0	-	2.0	-	0.4	-
Houston South	HS 5.0	W. Millers Reach Road	154	-	2.0	-	0.4	-	1.0	-	2.0	-	2.0	-	2.0	-	0.4	-
Big Lake	B 0.8	S. Burma Road	637	-	2.0	-	1.7	-	1.0	-	2.0	-	2.0	-	2.0	-	1.7	-
	B 3.2	Homestead Road	102	-	2.0	-	0.3	-	1.0	-	2.0	-	2.0	-	2.0	-	0.3	-
	B 5.0	Homestead Road	102	-	2.0	-	0.3	-	1.0	-	2.0	-	2.0	-	2.0	-	0.3	-
	B 11.1	S. Larrys Lane	102	-	2.0	-	0.3	-	1.0	-	2.0	-	2.0	-	2.0	-	0.3	-
	B 16.4	W. Calander Way	51	-	2.0	-	0.1	-	1.0	-	2.0	-	2.0	-	2.0	-	0.1	-
	B 16.7	W. Larae Road	102	-	2.0	-	0.3	-	1.0	-	2.0	-	2.0	-	2.0	-	0.3	-
Existing ARRC																		
Main Line	171.3	Cheri Lake Drive	205	11.0	13.0	3.0	3.6	1.0	1.0	0.9	1.0	0.9	1.0	0.9	1.0	2.9	3.5	
	180.0	N. Lynx Lake Road	102	11.0	13.0	1.5	1.8	1.0	1.0	0.9	1.0	0.9	1.0	0.9	1.0	1.5	1.7	
		W. Twitty Avenue /																
180.8	Nancy Lake Landing		102	11.0	13.0	1.5	1.8	1.0	1.0	0.9	1.0	0.9	1.0	0.9	1.0	1.5	1.7	
185.5	Willow Station Road		412	11.0	13.0	6.1	7.2	1.0	1.0	0.9	1.0	0.9	1.0	0.9	1.0	5.9	7.0	
186.9	Willow Fishhook Road		740	11.0	13.0	10.9	12.9	1.0	1.0	0.9	1.0	0.9	1.0	0.9	1.0	10.7	12.7	
<b>Totals by Alternative</b>																		
Mac West, Conn 1, Willow			819	-	-	-	2	-	1.0	-	2.0	-	2.0	-	2.0	-	2	-
Mac East, Conn 3, Willow			1,199	-	-	-	3	-	1.0	-	2.0	-	2.0	-	2.0	-	3	-
Mac West, Conn 1, Houston, Houston North			2,140	20	26	20	26	1.0	1.0	0.5	0.7	0.5	0.7	0.5	0.7	20	25	
Mac East, Conn 3, Houston, Houston North			2,521	20	27	20	27	1.0	1.0	0.5	0.6	0.5	0.6	0.5	0.6	20	26	
Mac West, Conn 1, Houston, Houston South			2,294	20	26	20	26	1.0	1.0	0.5	0.7	0.5	0.7	0.5	0.7	20	26	
Mac East, Conn 3, Houston, Houston South			2,674	20	27	20	27	1.0	1.0	0.4	0.6	0.4	0.6	0.4	0.6	20	27	
Mac West, Conn 2, Big Lake			2,865	23	31	23	31	1.0	1.0	0.5	0.6	0.5	0.6	0.5	0.6	22	30	
Mac East, Big Lake			2,660	23	30	23	30	1.0	1.0	0.5	0.7	0.5	0.7	0.5	0.7	22	29	

## **L.3 References**

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**APPENDIX M**  
**DRAFT SECTION 4(F) AND SECTION 6(F)**  
**EVALUATION**



## M. SECTION 4(F) AND SECTION 6(F) EVALUATION

This appendix includes impact analyses for Section 4(f) of the U.S. Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act.

### M.1 Section 4(f) Analysis

The U.S. Department of Transportation (USDOT) regulation known as “Section 4(f)” is not applicable to the Surface Transportation Board (STB or the Board) actions; however, it is applicable to the proposed Port MacKenzie Rail Extension (project) through the involvement of the Federal Railroad Administration (FRA).<sup>1</sup> The FRA could provide funding for the proposed rail line.

Section 4(f) was originally established in the U.S. Department of Transportation Act of 1966 (49 United States Code [U.S.C.] Section 1653(f) and later recodified as 49 U.S.C. 303. In 2005, Congress enacted legislation that required the USDOT to issue additional regulations that clarify 4(f) standards and procedures (USDOT, 2005). These new regulations were finalized in March, 2008, at 23 Code of Federal Regulations (CFR) 774. Section 4(f) mandates that the Secretary of Transportation shall not approve any transportation project requiring the use of publicly-owned parks, recreation areas or wildlife and waterfowl refuges, or significant historic sites, regardless of ownership, unless:

- There is no prudent and feasible alternative to using that land.
- The program or project includes all possible planning to minimize harm to the public park, recreation area, wildlife or waterfowl refuge, or significant site, resulting from that use.

To be protected under Section 4(f), public parks and recreation facilities must be considered “significant” (USDOT, 2005). Historic sites qualifying for Section 4(f) protection must be officially listed on, or eligible for inclusion on the *National Register of Historic Places*, or contribute to a historic district that is eligible for or listed on the National Register.

A “use” of properties protected under Section 4(f) occurs under either of the following conditions (23 CFR 771.135(p)):

- When land from a qualifying 4(f) property is acquired and permanently incorporated into a transportation facility.
- When there is a temporary occupancy of 4(f) land during construction of the transportation facility that is considered adverse to the preservationist purposes of the Section 4(f) statute.

In addition, a “constructive use” could occur when no land is acquired from a Section 4(f) property but the proximity of the project results in indirect impacts which would “substantially impair” the current use of the property such as visual, noise, or vibration impacts, or impairment of property access.

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<sup>1</sup> The lead agency for the Port MacKenzie Extension is the STB. FRA is a cooperating agency in NEPA process. Section 4(f) does not apply to the STB, so the FRA acts as lead agency in regard to the Section 4(f) analysis.

Section 6009(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2003: A Legacy for Users (SAFETEA-LU), amended existing Section 4(f) legislation to simplify the processing and approval of projects that have only *de minimis* impacts on resources protected by Section 4(f). A *de minimis* finding refers to a finding that a project would have little or no influence to the activities, features, and/or attributes of the Section 4(f) resource. This revision provides that once USDOT determines that the transportation use of any Section 4(f) property would result in a *de minimis* impact on that property, after consideration of any impact avoidance, minimization, and mitigation or enhancement measures, an analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete for that resource.

A finding of *de minimis* impact on a historic site may be made when:

- The process required by Section 106 of the National Historic Preservation Act (NHPA) of 1966 results in the determination of “no adverse affect” or “no historic properties affected” with the concurrence of the State Historic Preservation Office (SHPO) if participating in the Section 106 consultation.
- SHPO is informed of the lead agency’s intent to make a *de minimis* impact finding based on their written concurrence in the Section 106 determination.
- The lead agency has considered the view of any consulting parties participating in the Section 106 consultation.

Transportation project use of a park, recreation area, or wildlife and waterfowl refuge that qualifies for Section 4(f) protection may be determined to be *de minimis* if the following criteria are met:

- The transportation use of the Section 4(f) resource, together with any avoidance, minimization, and mitigation or enhancement measures incorporated into the project, does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f).
- The official(s) with jurisdiction over the property are informed of the lead agency’s intent to make the *de minimis* finding based on their written concurrence that the project will not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f).
- The public has been afforded an opportunity to review and comment on the impacts of the project on the protected activities, features, and attributes of the Section 4(f) resource.

Section M.1.d summarizes the Section 4(f) uses for proposed rail line segments that could impact Section 4(f) resources and includes the No-Action Alternative for comparison.

### **M.1.a Purpose and Need**

The Alaska Railroad Corporation (ARRC or the Applicant) has stated that the purpose of the Port MacKenzie Rail Extension is to provide rail service to Port MacKenzie and connect the Port with the remainder of the ARRC rail system, providing Port MacKenzie customers and shippers multi-modal options for movement of freight to and from the Port similar to that offered by other

ports handling large vessels. At present, freight truck is the only available mode of surface transportation for bulk materials and other freight to and from the Port. Because of the economics and efficiencies offered by direct rail service, the Applicant anticipates that bulk commodity movements to and from the Port would likely be by rail if such an option were available. The Applicant states that the proposed rail line would also support its statutory goal to foster and promote long-term economic growth and development in the State of Alaska.

### **M.1.b Proposed Action and Alternatives**

The proposed Port MacKenzie Rail Extension would involve construction and operation of a single-track rail line from Port MacKenzie to a point on the existing ARRC main line between Wasilla and just north of Willow, Alaska. ARRC proposes to construct and maintain the rail line to Class 4 standards<sup>2</sup>, and ARRC proposes to transport commercial freight on the rail line. The specific commodities to be shipped would be dependent on the Port MacKenzie customers that would choose to use the proposed rail line. The right-of-way (ROW) could contain an above-ground power line, buried utility lines, and an access road. In addition, ARRC would construct one rail line siding within the existing main line ROW at the tie-in location with the rail extension. The proposed action consists of a number of physical elements including (see Chapter 2 of this Draft Environmental Impact Statement [EIS]):

- Right-of-way (ROW) for rail line;
- Rail associated facilities (including towers and sidings);
- Bridges and Culverts;
- Access Roads; and
- Existing Grade Crossings.

Construction activities would include clearing within the ROW, constructing a permanent access road within the ROW, building a suitable railbed, track construction, acquisition of materials for rail construction (ballast, subballast, large armor rock, and materials for construction of rail ties and rails), creating construction staging areas, temporary bridges, and permanent associated facilities for the rail line. ARRC would also construct a terminal reserve area along the southern terminus of the rail line. This area would eventually consist of yard sidings, storage areas, and a terminal building to support train maintenance. ARRC has proposed two terminal reserve areas, but would build only one depending on which alternative the Board authorizes, if any.

ARRC anticipates that construction would take approximately 24 months. The specific timeframe and sequence of construction would depend on funding, final design, and permit conditions, such as requirements to avoid sensitive breeding periods for migratory birds and raptors and when salmon are spawning, incubating, or rearing in specific areas. Wintertime construction activities would be limited due to weather considerations and overall construction timing would be determined in consultation with land managers in consideration of human and environmental factors. The area in the ROW that is cleared of vegetation for construction, but

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<sup>2</sup> The Federal Railroad Administration (FRA) establishes the standards for class of track and maximum operating speed for passenger and freight on each class of track (49 Code of Federal Regulations [CFR] 213). Design and construction of the proposed Port MacKenzie Rail Extension to Class 4 standards would be required for ARRC's desired operating speed for freight (60 miles per hour) service.

not needed for permanent structures, would be restored to natural conditions, to the extent practicable, consistent with rail line operating requirements.

Train frequency could vary but ARRC anticipates that traffic on the Port MacKenzie Rail Extension would average 2 freight trains per day (one in each direction), with an average of 40 to 80 freight cars each.<sup>3</sup> Train speeds would not exceed 60 miles per hour. ARRC would conduct periodic maintenance and inspections to ensure operation of a safe and reliable rail line. The primary maintenance activities would include signal testing and inspection; minor rail, tie, and turnout replacement; and routine ballasting and surfacing tasks. Additional activities would be performed on an as-needed basis and would include vegetation control, snow removal, and vehicle and equipment maintenance.

The alternatives discussed in the EIS are the outcome of an extensive alternatives analysis process that began with the 2003 Matanuska-Susitna Borough (MSB) study to identify potential corridors that could be used for both road and rail connections between Port MacKenzie and the existing ARRC mainline or the George Parks Highway. The 2003 corridor study identified eleven potential alignments.

From September to December 2007, MSB and ARRC jointly conducted an analysis based on rail line engineering requirements and available environmental data to re-evaluate the alignments from the 2003 MSB study and develop feasible rail line alignments that could minimize potential impacts to the environment. The analysis considered factors that influence the development of a rail line, such as land management/ownership and human and environmental factors. These included: waterbodies, anadromous streams, archaeological and historic properties, native allotments, parks and refuges, wetlands, wetland banks, limiting soils, prison facilities, developed parcels, and land ownership. These factors were translated into a Geographic Information System analysis, whereby they could be used cumulatively to determine 5,000-foot-wide corridors for the possible Port MacKenzie Rail Extension. Engineers then identified 200-foot-wide zones within these corridors that were both feasible from an engineering standpoint and would best minimize potential impacts.

Members of the public had the opportunity to comment on ARRC's preliminary alignments at five public meetings in October 2007. ARRC held meetings in the communities of Wasilla, Big Lake, Willow, Knik, and Houston. ARRC received a total of 361 comments from the public regarding Port MacKenzie Rail Extension alignments. Based on this information, in January 2008, ARRC issued the Preliminary Environmental and Alternatives Report (ARRC 2008), which presented eight possible alignment configurations. These eight potential rail line alignments are different from, although some are similar to, the eleven road/rail line corridors identified in 2003.

The Board's Section on Environmental Analysis (SEA) reviewed the alignment development process during the National Environmental Policy Act (NEPA) scoping period, and requested

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<sup>3</sup> This estimated level of train traffic, which would be sufficient to fill approximately 13 Panamax class ships per year with bulk materials at Port MacKenzie, was based on market opportunities at the time of filing and the supply based infrastructure and equipment limitations. Based on current market opportunities, ARRC now estimates ship traffic for export of bulk commodities from the Port MacKenzie Rail Terminal would include five Panamax class ships per year. Thus, the estimated average of two trains per day used in the EIS analysis is conservative.

that the Applicant complete refinements to the alignments based on public comment and consultation with cooperating agencies. Both SEA and the cooperating agencies utilized the purpose and need factor (as described in Section M.1.a) to review ARRC's initial alignments. Through this review, SEA and the cooperating agencies selected a reasonable range of alternatives to study in detail in the EIS and to eliminate alternatives and segments from detailed study. SEA and the cooperating agencies considered eliminating from detailed study segments that did not meet fundamental components of the purpose and need, would lead to substantially greater adverse environmental impacts, or that featured insurmountable construction and/or operations limitations.

A summary of the alignment development process and alternatives analyzed and eliminated from consideration is available in Chapter 2 of the Draft EIS. There is no option for the Board to authorize an individual segment;<sup>4</sup> the Board would only authorize a complete route from Port MacKenzie to ARRC's main line, which would be comprised of a combination of the segments under consideration.

### **M.1.c Section 4(f) Property Description**

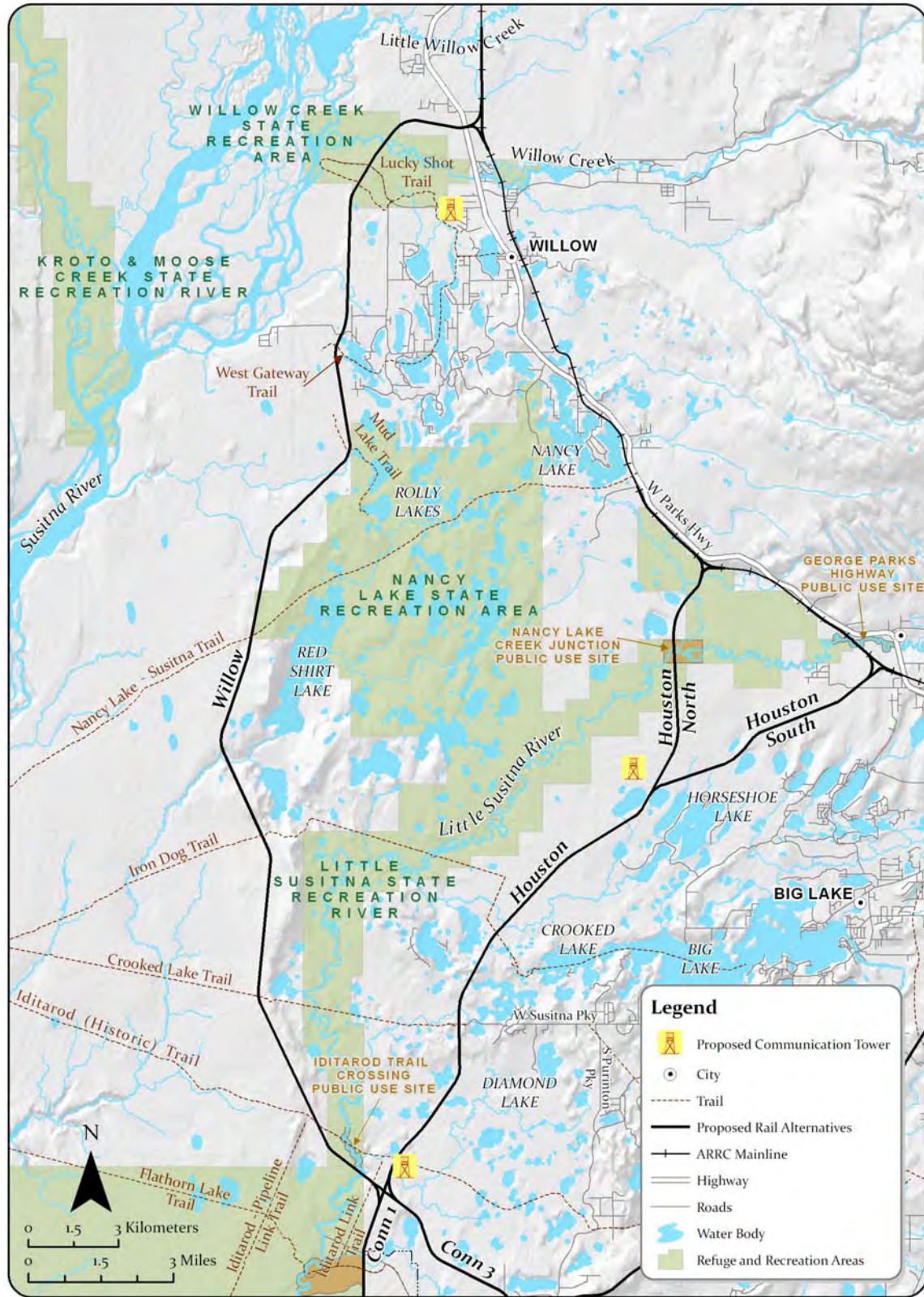
A publicly-owned park, recreation area, or wildlife and waterfowl refuge must be a "significant" resource for Section 4(f) to apply. Pursuant to 23 CFR 771.135(c), 4(f) resources are presumed to be significant unless the official having jurisdiction over the site concludes that the entire site is not significant. SEA, on behalf of FRA, consulted with the agencies with jurisdiction over the Section 4(f) resources. These agencies have commented on the significance of the Section 4(f) resources that would be crossed by one or more of the proposed rail line segments. This section describes SEA's preliminary determination of Section 4(f) properties that are located within the project area. Figures M-1 through Figure M-3 show these resources and the proposed rail line segments analyzed in detail in the Draft EIS. The resources discussed below as qualifying for protection under Section 4(f) because their primary purpose is for recreation are publicly accessible either through public easements or public ownership, or both.

#### **M.1.c.1 Parks and Recreation Areas**

Three state recreation areas and 13 officially recognized trails identified in adopted public documents that are located within the project area are considered to qualify as Section 4(f) resources. These 13 officially recognized trails have been specifically established within currently adopted plans by the Alaska Department of Natural Resources (ADNR) and/or MSB and are located on state or MSB property and/or have a recorded public ROW or easement. In some cases, there are additional trails located within other Section 4(f) properties in the project area. These trails are not discussed separately as individual 4(f) resources, instead they are considered in this evaluation as a component of another Section 4(f) property.

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<sup>4</sup> An alignment consists of a combination of segments from Port MacKenzie to the ARRC mainline. ARRC identified segments and alignments. Alignments that SEA and the cooperating agencies selected for analysis in detail in the EIS are referred to as alternatives.



**Figure M-1. Section 4(f) Resources along the Willow, Houston, Houston North, and Houston South Segments**



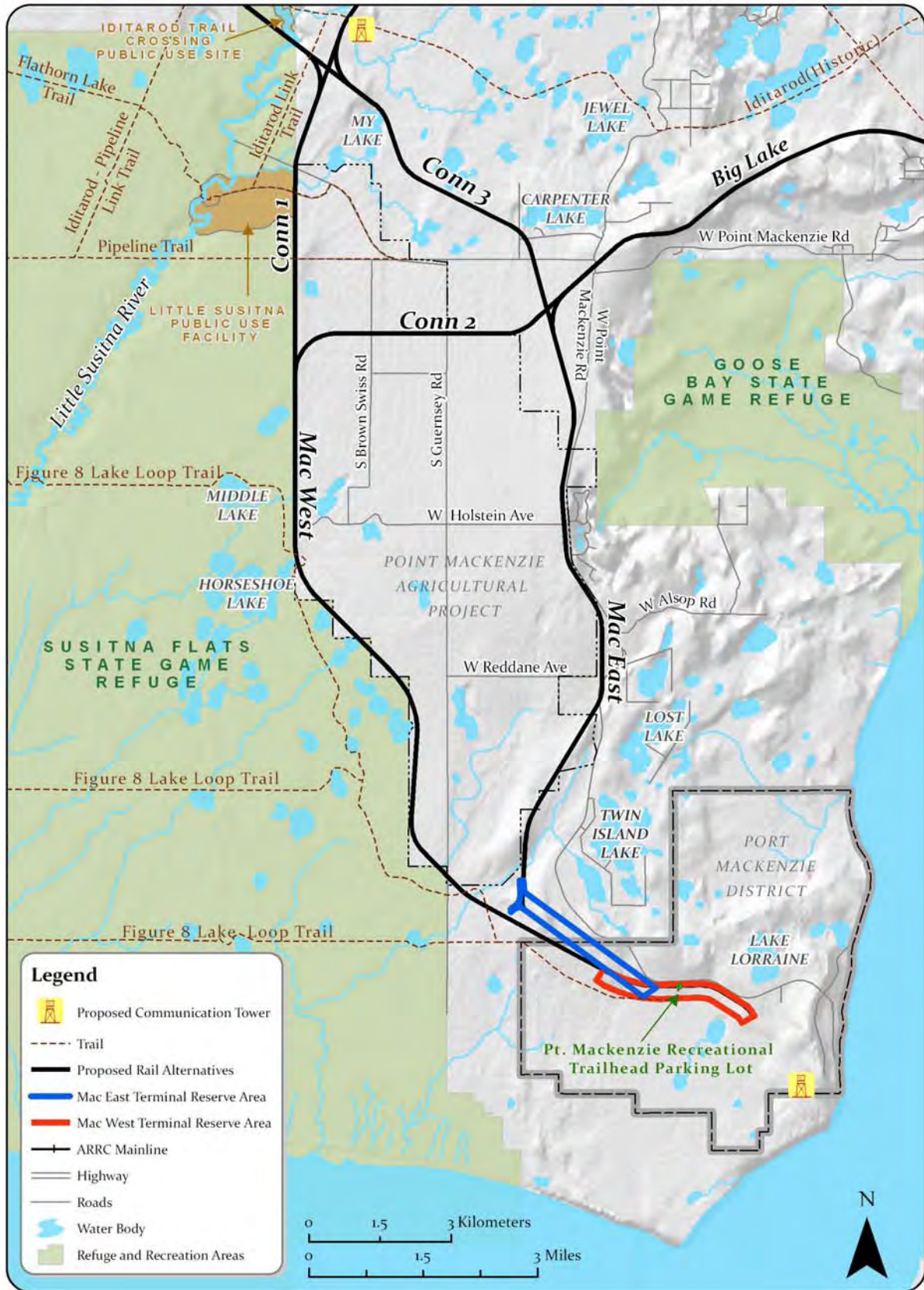


Figure M-2. Section 4(f) Resources along the Mac East, Mac West, and Connector Segments



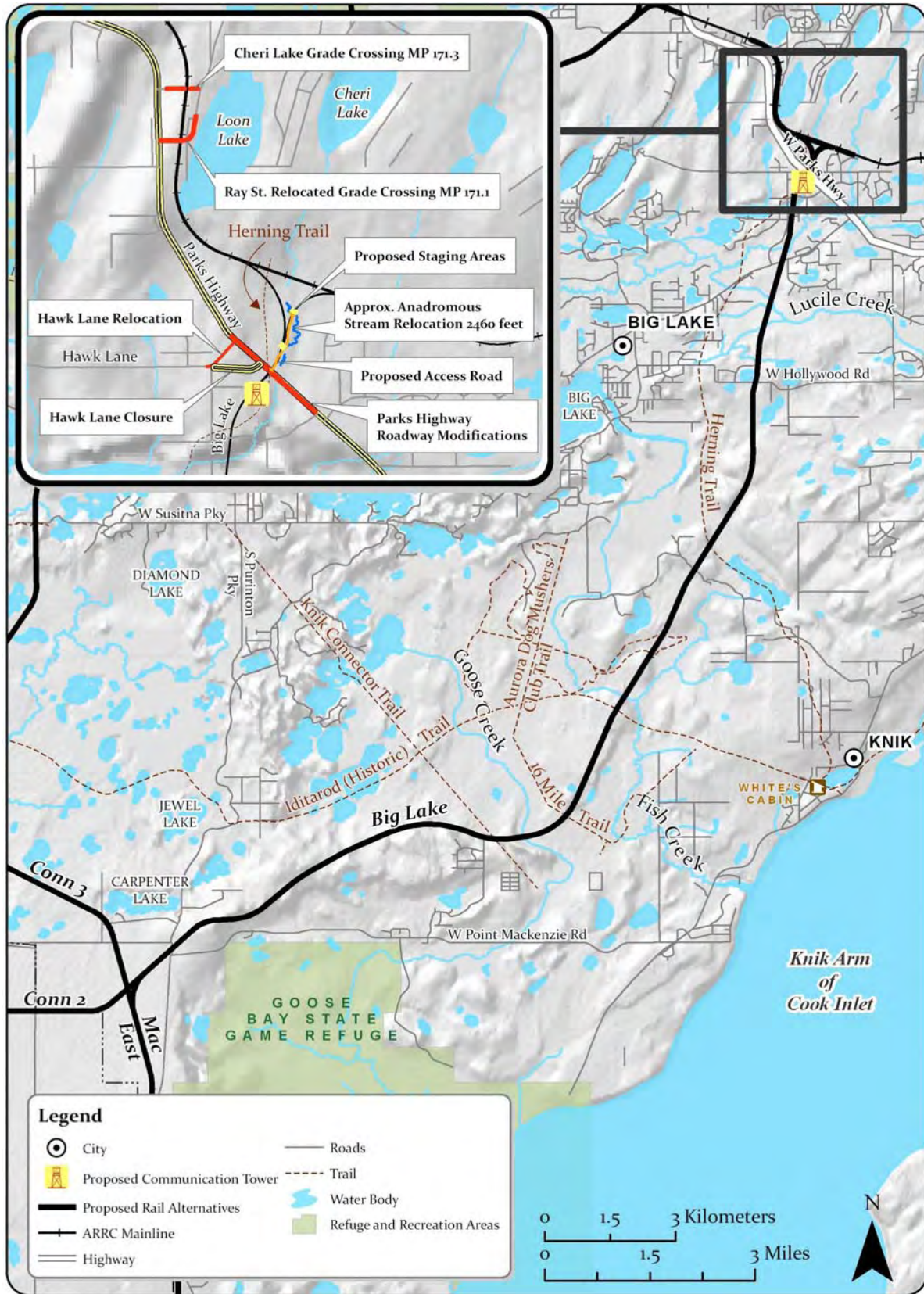


Figure M-3. Section 4(f) Resources along the Big Lake Segment



## **Little Susitna State Recreation River**

### **Size and Location**

The Little Susitna State Recreation River is located between the northeast corner of the Susitna Flats State Game Refuge and the City of Houston (see Figure M-1). The area includes the Little Susitna River and a corridor bordering the river (the corridor ranges from 0.5 mile to more than 2 miles wide in some sections). The area would be crossed by the Willow and Houston North segments.

### **Ownership<sup>5</sup> and Type of Section 4(f) Property**

The Little Susitna State Recreation River is publicly owned and managed by ADNR. The Little Susitna State Recreation River is a publicly-owned recreational area and therefore qualifies as a Section 4(f) resource. Crossing the Little Susitna State Recreation River would require land conversion and conveyance to ARRC, which would constitute a use of a Section 4(f) property.

### **Function of the Property and Available Activities**

The Little Susitna State Recreation River functions as one of six designated “state recreation rivers” in the Susitna River Basin. The Little Susitna River offers public recreation opportunities, most notably boating, camping, fishing, hiking, and all-terrain vehicle use on trails along the banks of the river. The river is home to the second largest coho salmon harvest in Alaska (ADF&G 2004). The Little Susitna River is estimated to receive between 2,000 and 3,000 float trips per year, not counting motorized trips (ADNR 2007). The area is used for camping, with approximately 69 undeveloped campsites scattered throughout the corridor (ADNR 1991).

The river area also includes several “public use sites,” areas identified for public access, fishing, camping, or other recreation or public use. Three of these sites within the Little Susitna State Recreation River are of particular note due to proximity to potential rail crossings. The George Parks Highway Bridge Public Use Site is located downstream from the Parks Highway crossing of the Little Susitna River, and receives heavy use due to its easy accessibility. It is used for bank fishing, day use, and launching float boats. The Nancy Lake Creek Junction Public Use Site, another camping and fishing area, is located at the creek’s confluence with the Little Susitna River, approximately 4.5 miles west of the City of Houston. It would be potentially crossed by the Houston North Segment. The Iditarod Trail Crossing Public Use Site, located along the river immediately north of the point where the Willow Segment is proposed to cross, is a camping area.

### **Description of Existing and Planned Uses**

The Little Susitna State Recreation River is managed to maintain multiple resources as described in the Susitna Basin Recreation Rivers Management Plan (ADNR 1991). However, the Recreation Rivers Act (Alaska Statute 41.23.500) states that the primary purpose for the

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<sup>5</sup> “Ownership” refers to the current owner of the property.

establishment of the six recreation rivers is the maintenance and enhancement of the land and water for recreation. The Susitna Basin Recreational Rivers Management Plan identifies a Special Management Area where the MSB has indicated interest in the extension of South Big Lake Road/West Susitna Parkway to cross the Little Susitna River and provide access to lands to the west. This is part of the West Mat-Su Access project to provide access to the Fish Creek Management Area. Three crossing locations are being studied by the MSB: the extension of the Susitna Parkway in the Big Lake area, a location approximately 0.8 mile north of where the Iditarod National Historic Trail crosses the river, and near the existing Little Susitna River access at the end of Ayrshire Road (MSB 2007). The South Big Lake Road/West Susitna Parkway currently extends to within approximately 1.4 miles of the Little Susitna River, at present, terminating south of West Papoose Lake, while Ayrshire Road presently terminates at its junction with the Little Susitna Public Use Facility access road, approximately 1.5 miles east of the Little Susitna River.

### **Access**

Access is available from the river mouth on the Cook Inlet by way of boat, at the Little Susitna Public Use Facility just south of the recreation river area, from Nancy Lake State Recreation Area via a portage trail at the Skeetna Lake Portage Public Use Facility, from the Miller's Reach Road access and boat launch, and from the Parks Highway where it crosses the Little Susitna River.

### **Relationship to other Similarly Used Lands in the Vicinity**

Nearby facilities offering similar activities include the Nancy Lake State Recreation Area, Willow Creek State Recreation Area, Susitna Flats State Game Refuge, Big Lake North and South State Recreation Sites, a City of Houston campground along the Little Susitna River north of the Parks Highway, and numerous lakes and rivers throughout the project area. Willow Creek, located within Willow Creek State Recreation Area, is another sport fishing river with a large annual salmon harvest. The other five state recreation rivers outlined in the Susitna Basin Recreation Rivers Management Plan are also within relative proximity, though none are as easily accessible as the Little Susitna River.

### **Applicable Clauses Affecting the Ownership**

The ADNR is bound by state law to provide access to and along public and navigable water bodies (11 Alaska Administrative Code (AAC) 38.05.127 and 11 AAC 51.045, respectively) prior to granting a lease or conveying land. ADNR Regulation 11 AAC 51.025 establishes that ADNR will reserve a 50- to 100-foot<sup>6</sup> public easement along section lines before selling, leasing, or otherwise disposing of the surveyed land estate, unless and until it is vacated under 11 AAC 51.065. Section line easements leading to public or navigable water are not to be vacated.

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<sup>6</sup> Width of the easement depends on whether the section line forms the boundary of the land being disposed (50 foot-wide easement) or whether it runs through the land being disposed (100 foot-wide easement).

## **Nancy Lake State Recreation Area**

### **Size and Location**

The Nancy Lake State Recreation Area is a 22,685-acre facility located west of the Parks Highway and the City of Houston and south of the community of Willow. As illustrated in Figure M-1 and Figure M-4, the Willow Segment would cross through a small corner of the western-most segment of the Recreation Area.

### **Ownership and Type of Section 4(f) Property**

The Nancy Lake State Recreation Area is publicly owned and managed by ADNR. Because the Nancy Lake State Recreation Area is a publicly-owned recreational area, it qualifies as a Section 4(f) resource. Crossing the Recreation Area with the proposed rail line would constitute a use of a Section 4(f) property.

### **Function of the Property and Available Activities**

The Recreation Area is characterized by interconnected lakes and rolling landscapes. Some of the recreation activities available include canoeing, picnicking, fishing, hiking, camping, dog sledding, skiing, snowshoeing, and snowmachining. Nancy Lake currently receives approximately 40,000 visitors per year, with the highest use in the summer (ADNR 2007).

### **Description of Existing and Planned Uses**

The Nancy Lake State Recreation Area is a destination for outdoor recreation activities. The main objective identified within the Nancy Lake State Recreation Area Management Plan is “to provide a maximum level of outdoor recreation opportunities as long as the intensity of modification does not diminish the unit’s natural and cultural values” (ADNR 1983). ADNR has initiated a revision to the Management Plan, written in 1983 (ADNR 2008a). The intent of the revision is to address the higher volume of users the park accommodates today versus when the management plan was drafted.

### **Access**

Access is available directly off the Parks Highway south of the community of Willow, via Nancy Lake Access Road. Access is also available from the Nancy Lake – Susitna Trailhead located at mile 67 of the Parks Highway. The Little Susitna State Recreation River is located adjacent to the southeast portion of Nancy Lake State Recreation Area, and canoeists can portage from the river to Nancy Lake to utilize the water trail system within the Recreation Area. The park is also accessible via numerous land and water trails.

### **Relationship to other Similarly Used Lands in the Vicinity**

Nearby facilities offering similar activities include the Little Susitna State Recreation River, Willow Creek State Recreation Area, Susitna Flats State Game Refuge, Big Lake North and South State Recreation Sites, a City of Houston campground along the Little Susitna River north of the Parks Highway, and numerous lakes and rivers throughout the project area.

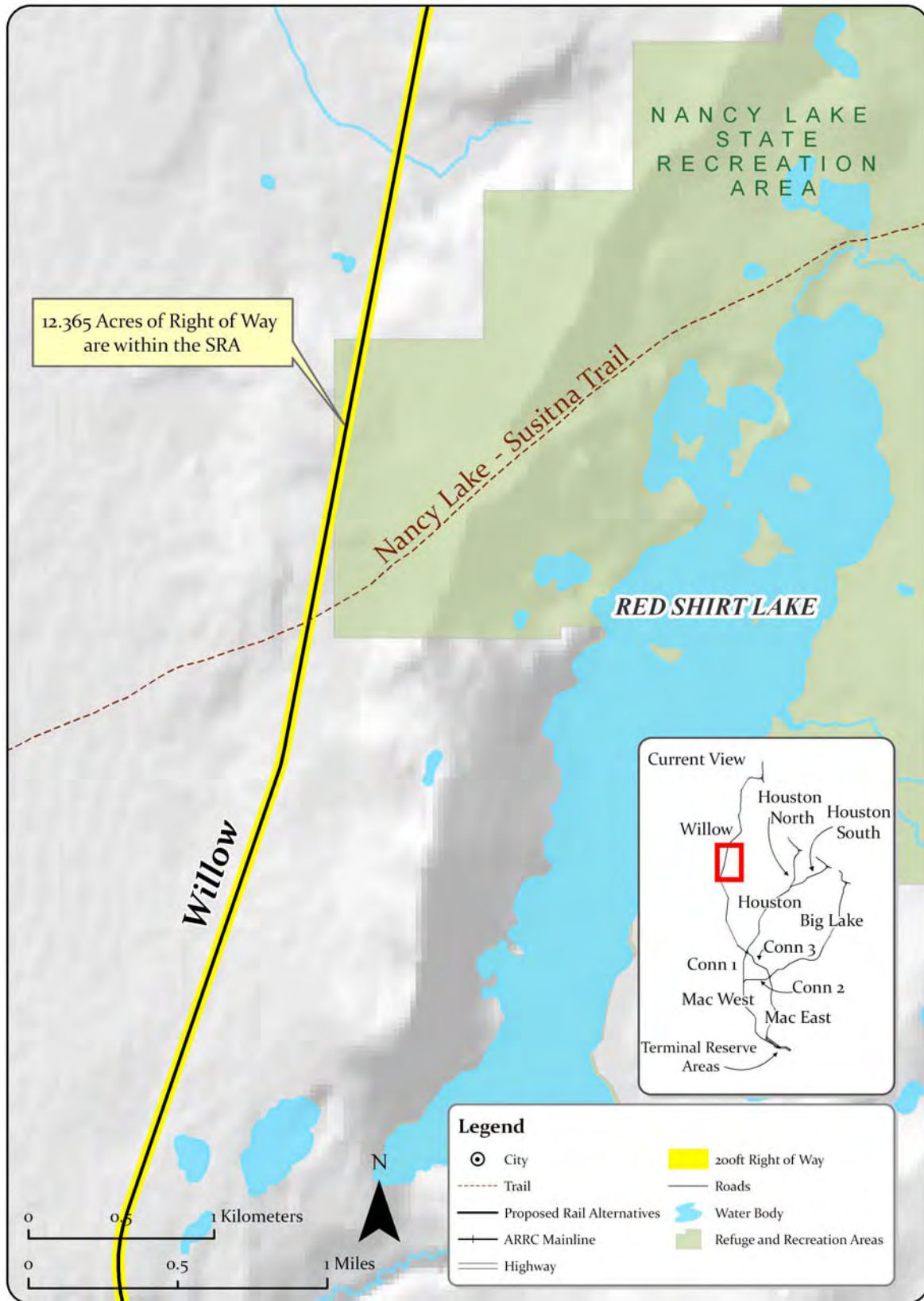


Figure M-4. Section 6(f) Resources

## **Applicable Clauses Affecting the Ownership**

The ADNR is bound by state law to provide access to and along public and navigable water bodies (11 AAC 38.05.127 and 11 AAC 51.045, respectively) prior to granting a lease or conveying land. ADNR Regulation 11 AAC 51.025 establishes that ADNR will reserve a 50- to

100-foot public easement along section lines before selling, leasing, or otherwise disposing of the surveyed land estate, unless and until it is vacated under 11 AAC 51.065. Section line easements leading to public or navigable water are not to be vacated. The Nancy Lake State Recreation Area has received funding under the Land and Water Conservation Fund Act (Public Law 88-578). Areas that have received such funds may not be converted to non-recreational uses without a determination by the Secretary of the Interior that the conversion is in accordance with the statewide outdoor recreation plan, and that non-recreation land of at least equal fair market value, usefulness, and location has been substituted for the land to be converted (see M.2, for the Section 6(f) Evaluation).

## **Willow Creek State Recreation Area**

### **Size and Location**

The Willow Creek State Recreation Area is an approximately 3,000-acre facility located northwest of the community of Willow. The majority of the Recreation Area is located west of the Parks Highway though a small part of the area is located east of the highway (see Figure M-1). As shown in Figure M-1, the Willow Segment would cross through approximately the center of the recreation area.

### **Ownership and Type of Section 4(f) Property**

The Willow Creek State Recreation Area is publicly owned and managed by ADNR. The Recreation Area is a publicly-owned recreational area and therefore qualifies as a Section 4(f) resource. Crossing the Recreation Area would require land conversion and conveyance to ARRC, which would constitute a use of a Section 4(f) property.

### **Function of the Property and Available Activities**

The Recreation Area encompasses almost all of Willow Creek, from the Parks Highway to its confluence with the Susitna River. Willow Creek is a site for sport fishing activity, especially during the king salmon season. Recreational activities available in the area include fishing, camping, floating/boating, hiking along winter trails, wildlife viewing, and hunting. Willow Creek receives approximately 42,000 visitors per year, with the majority of visits occurring during non-winter months. Winter usage focuses primarily on trail use (ADNR 2007).

The Lucky Shot Trail, which is located within the Willow Creek State Recreation Area, would be crossed by the Willow Segment. This trail is part of the West Gateway Trail System and is characterized as a multi-use winter trail intended to provide high quality recreational facilities to the public. Where the Willow Segment would cross the trail, the land is state-owned and managed by ADNR. The trail supports mainly winter recreation activities including

snowmachining, dog sledding, skijoring, and skiing. The trail is one of the oldest in the West Gateway Trails System and was originally cleared for freighting from the Hatcher Pass mines to the Susitna River approximately 100 years ago.

### **Description of Existing and Planned Uses**

The Willow Creek State Recreation Area is a destination for outdoor recreation activities. No other planned uses are known at this time.

### **Access**

Access is available directly off the Parks Highway north of the community of Willow, via Willow Creek Parkway and Willow Fishhook Road. The Recreation Area is also accessible via numerous land trails including the West Gateway Trail System and the Lucky Shot Trail and by water via Willow Creek and the Little Susitna River.

### **Relationship to other Similarly Used Lands in the Vicinity**

Nearby facilities offering similar activities include the Little Susitna State Recreation River, Nancy Lake State Recreation Area, Susitna Flats State Game Refuge, Big Lake North and South State Recreation Sites, a City of Houston campground along the Little Susitna River north of the Parks Highway, and numerous lakes and rivers throughout the project area. The Little Susitna River is another easily-accessible river that provides very high-quality salmon fishing, and five other state recreation rivers are in relatively close proximity.

### **Applicable Clauses Affecting the Ownership**

The ADNR is bound by state law to provide access to and along public and navigable water bodies (11 AAC 38.05.127 and 11 AAC 51.045, respectively) prior to granting a lease or conveying land. ADNR Regulation 11 AAC 51.025 establishes that ADNR will reserve a 50- to 100-foot public easement along section lines before selling, leasing, or otherwise disposing of the surveyed land estate, unless and until it is vacated under 11 AAC 51.065. Section line easements leading to public or navigable water are not to be vacated.

## **West Gateway Trail**

### **Size and Location**

The West Gateway Trail<sup>7</sup> is located west of the Parks Highway, between the Willow Creek and Nancy Lake State Recreation Areas. The 5.9-mile-long West Gateway Trail is part of a network of trails that collectively total tens of miles. As illustrated in Figure M-1, the trail would be crossed by the Willow Segment.

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<sup>7</sup> The West Gateway Trail is part of a larger grouping of trails known as the “West Gateway Trails System.” The West Gateway Trail System is outlined in the Willow Area Trail Plan (Willow Area Community Organization 2006).

### **Ownership and Type of Section 4(f) Property**

The MSB maintains a trail right-of-way at the location where the Willow Segment would cross the West Gateway Trail. The trail is included in the MSB Recreational Trails Plan (MSB 2008, as amended) and the Willow Area Trail Plan (Willow Area Community Organization 2006). The trail is considered a Section 4(f) resource because its primary purpose is recreation and it provides access to other publicly-owned recreational areas. Crossing the trail would be considered a use of a Section 4(f) property where the trails are located on accessible public lands.

### **Function of the Property and Available Activities**

The West Gateway Trail provides access from the Parks Highway across Willow Lake to the larger West Gateway Trails System further west. The trails are meant to provide recreational opportunities to the public. The trails support mainly winter recreation activities, including snowmachining, dog sledding, skiing, and skijoring. The trails are used for competitions including the Klondike 400 and Aurora 200 snowmachine races, the Junior Iditarod, the Don Bowers 200/300 sled dog race, Klondike 300 sled dog race, and the Earl Norris Open Sled Dog Race (Willow Area Community Organization 2006). In recent years, the Iditarod Trail Sled Dog Race has used the West Gateway Trail for its restart location.

### **Description of Existing and Planned Uses**

The West Gateway Trail is a recreational resource within the community of Willow. The West Gateway Trail is an officially recognized trail with an easement reserved to the State of Alaska (ADL 229107-A) which was acquired by the MSB. The trail is located on frozen lakes, sloughs, swamps, and overland.

### **Access**

Access is available from Willow Lake, just west of the Parks Highway and south of Willow Creek State Recreation Area.

### **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby, including other trails of the West Gateway Trails System. Nearby, the Willow and Nancy Lake State Recreation Areas have many miles of trails within their park boundaries, and many other trails crisscross the project area. South of Big Lake, the Aurora Dog Mushers Trails serve a similar purpose as the West Gateway System; both are maintained loop trails that are suitable for dog sledding, racing and training.

### **Applicable Clauses Affecting the Ownership**

West Gateway Trail is officially recognized with an easement held by the MSB where it would be crossed by the proposed rail line.

## **Mud Lake Trail**

### **Size and Location**

The Mud Lake Trail is a 2.8-mile-long multi-use winter trail located near the northwest corner of the Nancy Lake State Recreation Area, and trending northwest to southeast. It is part of the West Gateway Trail System and, as depicted in Figure M-1, the trail would be crossed by the Willow Segment.

### **Ownership and Type of Section 4(f) Property**

The Mud Lake Trail is publicly owned and has been identified in the MSB Recreational Trails Plan (MSB 2008, as amended). Where the Willow Segment would intersect the trail, the land is owned by the state of Alaska and managed by ADNR. The trail is considered a Section 4(f) resource since its primary purpose is for recreation and it provides access to other publicly-owned recreational areas. Crossing the trail would be considered a use of a Section 4(f) property.

### **Function of the Property and Available Activities**

The Mud Lake Trail is a multi-use winter trail, and provides access between Nancy Lake State Recreation Area and the West Gateway Trail System. Available activities are the similar to those described for the Lucky Shot Trail.

### **Description of Existing and Planned Uses**

Mud Lake Trail is part of a major recreational trail system within the community of Willow. The Mud Lake Trail is an officially recognized trail with an easement held by the State of Alaska (ADL 229107-D). No planned uses are known at this time.

### **Access**

Access is available from the trails within the Nancy Lake State Recreation Area and via the West Gateway Trail System trailhead near the Parks Highway.

### **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby, including the West Gateway Trails System, Nancy Lake State Recreation Area Trails, and the Iron Dog and Crooked Lake Trails to the south.

### **Applicable Clauses Affecting the Ownership**

Mud Lake Trail is an officially recognized trail with an easement held by the State of Alaska (ADL 229107-D) where it would be crossed by the proposed rail line.



## **Nancy Lake – Susitna Trail**

### **Size and Location**

The Nancy Lake – Susitna Trail is a 26-mile-long multi-use winter trail located in and southwest of the Nancy Lake State Recreation Area (see Figure M-1). It begins at the Nancy Lake – Susitna Trailhead at mile 67 of the Parks Highway. From there it trends west-southwest past the south shore of Nancy Lake to Susitna Landing.

### **Ownership and Type of Section 4(f) Property**

The Nancy Lake – Susitna Trail is owned by the state of Alaska and managed by the ADNRS at the location where it would be crossed by the Willow Segment. The trail is considered a Section 4(f) resource since its primary purpose is for recreation and it provides access to other publicly-owned recreational areas. Crossing the trail would be considered a use of a Section 4(f) property.

### **Function of the Property and Available Activities**

The Nancy Lake – Susitna Trail is a multi-use winter trail, and provides access from the Parks Highway to Nancy Lake State Recreation Area and the Susitna River. Through connecting trails, the Nancy Lake – Susitna Trail can be used to access the Little Susitna State Recreation River.

### **Description of Existing and Planned Uses**

The Nancy Lake – Susitna Trail is an officially recognized trail with an easement owned by the state of Alaska (RST 149). No planned uses are known at this time.

### **Access**

Access to the Nancy Lake – Susitna Trail is available from the trailhead at mile 67 of the Parks Highway, from the Susitna River, and from the trails within the Nancy Lake State Recreation Area.

### **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby, including the trails found within the Nancy Lake State Recreation Area and the Little Susitna State Recreation River as well as the Iron Dog Trail and Iditarod National Historic Trail (INHT).

### **Applicable Clauses Affecting the Ownership**

The Nancy Lake – Susitna Trail is an officially recognized trail with an easement held by the state of Alaska (RST 149) where it would be crossed by the proposed rail line.

## **Iron Dog Trail**

### **Size and Location**

The Iron Dog Trail is a 16.9-mile-long multi-use winter trail located south of the Nancy Lake State Recreation Area and trending generally east to west, connecting the Big Lake area with the Susitna River (see Figure M-1). The trail would be crossed by the Willow Segment south of Cow Lake.

### **Ownership and Type of Section 4(f) Property**

The Iron Dog Trail is publicly owned and managed by the MSB at the location where the Willow Segment would cross the trail. It has also been identified in the MSB Recreational Trails Plan (MSB 2008, as amended). The trail is considered a Section 4(f) resource since its primary purpose is for recreation and it provides access to other publicly-owned recreational areas. Crossing the trail would be considered a use of a Section 4(f) property.

### **Function of the Property and Available Activities**

The Iron Dog Trail is a multi-use winter trail, and provides access between the Big Lake area and the Susitna River. Available activities are similar to those described for the Lucky Shot Trail. In addition, this trail hosts the annual Iron Dog Snowmobile Race, the longest such race in the world.

### **Description of Existing and Planned Uses**

The Iron Dog Trail is part of a recreational trail system that supports a variety of winter sports in the MSB. The Iron Dog Trail is an officially-recognized trail with easements held by the State of Alaska, Division of Parks and Outdoor Recreation (ADL 227832-B) and the MSB. No planned uses are known at this time.

### **Access**

Access is available from Flat Lake just west of Big Lake, and from the Crooked Lake Trail, which is accessible via Crooked Lake and South Big Lake Road/Papoose Twins Road.

### **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby, including the Crooked Lake Trail, the Nancy Lake – Susitna Trail, other trails in the Nancy Lake State Recreation Area, and the INHT. Many unrecorded and/or unofficial trails also exist throughout this area.

### **Applicable Clauses Affecting the Ownership**

The Iron Dog Trail is an officially recognized trail with an easement held by the MSB where it would be crossed by the proposed rail line.

## **Crooked Lake Trail**

### **Size and Location**

The Crooked Lake Trail is a multi-use winter trail located west of the Big Lake area, generally trending east-west. As illustrated in Figure M-1, the trail would be crossed by the Willow Segment southwest of Hock Lake and by the Houston Segment southwest of Crooked Lake.

### **Ownership and Type of Section 4(f) Property**

The 10.2-mile-long Crooked Lake Trail has been identified in the MSB Recreational Trails Plan (MSB 2008, as amended) and is located on land owned by the MSB where the Willow Segment would cross the trail. Because its primary purpose is for recreation and it provides access to other publicly-owned recreational areas, the trail is considered a Section 4(f) resource and crossing the trail would be considered a use of a Section 4(f) property.

### **Function of the Property and Available Activities**

The Crooked Lake Trail is a multi-use winter trail, and provides access between the Big Lake area and the Susitna River. Available activities are similar to those described for the Lucky Shot Trail.

### **Description of Existing and Planned Uses**

The Crooked Lake Trail is part of a recreational trail system that supports a variety of winter sports in the MSB. Crooked Lake Trail is an officially recognized trail with an easement held by the MSB (ADL 227921). Land management for this area is governed by the Fish Creek Management Plan (ADNR 1984 as amended), which describes the MSB's intention to provide increased access and development opportunities for this area. A Draft Fish Creek Management Plan revision is currently under consideration by the MSB and ADNR.

### **Access**

Access is available from roadside parking off of West Papoose Twins Road, west of the Big Lake area, and also from the Iron Dog Trail by way of the Flat Lake Connector Trail.

### **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby, including the Iron Dog Trail, Nancy Lake State Recreation Area Trails, INHT, Flathorn Lake Trail, and Pipeline Trail. Many unrecorded and/or unofficial trails also exist throughout this area.

### **Applicable Clauses Affecting the Ownership**

Crooked Lake Trail is an officially recognized trail with an easement held by the MSB where it would be crossed by the proposed rail line.

## **Iditarod Link Trail**

### **Size and Location**

The Iditarod Link Trail is a 2.4-mile-long multi-use winter trail that follows a seismic line connecting the INHT and Flathorn Lake Trail, trending northeast-southwest (see Figure M-1). It is located north of Little Susitna Public Use Facility Access Road, just east of the Little Susitna River (see Figure M-2). The trail would be crossed by the Willow Segment or Connector 1 Segment near where the two segments join northwest of My Lake.

### **Ownership and Type of Section 4(f) Property**

The Iditarod Link Trail is publicly owned and managed by the MSB where it would be crossed by the Willow Segment or Connector 1 Segment. It has been identified in the MSB Recreational Trails Plan (MSB 2008, as amended). The trail is considered a Section 4(f) resource since its primary purpose is for recreation and it provides access to other publicly-owned recreational areas. Crossing the trail would be considered a use of a Section 4(f) property.

### **Function of the Property and Available Activities**

The Iditarod Link Trail is a multi-use winter trail, and provides access between the INHT and Flathorn Lake Trail. Available activities are the similar to those described for the Lucky Shot Trail.

### **Description of Existing and Planned Uses**

The Iditarod Link Trail is part of a recreational trail system that supports a variety of winter sports in the MSB. Iditarod Link Trail is an officially recognized trail with an easements held by the MSB and the State of Alaska (ADL 229108-G). The MSB collects trail fees at a maintained trailhead north of Ayrshire Road, approximately 2 miles southwest of the point where the trail would be crossed by the Willow Segment or Connector 1 Segment.

### **Access**

Access is available from a roadside parking area owned, operated, and maintained by the MSB, via Little Susitna Public Use Facility Access Road, and via the Iditarod and Flathorn Lake Trails (Flathorn Lake Trail co-locates with Public Use Facility Access Road).

### **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby, including the Iron Dog Trail, INHT, Flathorn Lake Trail, and Pipeline Trail. Many unofficial and/or unrecorded trails also exist throughout this area, including non-designated trails within the Little Susitna State Recreation River and Susitna Flats State Game Refuge.

## **Applicable Clauses Affecting the Ownership**

Iditarod Link Trail is an officially recognized trail with an easement held by the MSB where it would be crossed by the proposed rail line.

### **Figure 8 Lake Loop Trail**

#### **Size and Location**

The Figure 8 Lake Loop Trail is a 63.3-mile-long multi-use winter trail system originating near the Port MacKenzie area, and tracking to the west through the Susitna Flats State Game Refuge to the Susitna River (see Figure M-2). The trail would be crossed four times by the Mac West Segment. There would be two crossings at a bend of the trail where it passes by the northeast branch of Horseshoe Lake. The remaining two crossings would occur at another bend in the trail – one just east of and one just west of an unidentified stream at Mile Post 4.6 along the rail alignment. The ROW for the Mac East Segment would be located within 10 feet of the trail. The Mac East Terminal Reserve Area would be located within approximately 160 feet of the trail and the Mac West Terminal Reserve Area would cover 700 feet of the trail.

#### **Ownership and Type of Section 4(f) Property**

The Figure 8 Lake Loop Trail is owned by the MSB, private landowners, and unknown landowners where the Mac West Segment crossings would occur, and by the MSB where the Mac West Terminal Reserve Area would overlap with the trail. The trail has been identified in the MSB Recreational Trails Plan (MSB 2008, as amended). The trail is considered a Section 4(f) resource since its primary purpose is for recreation and it provides access to other publicly-owned recreational areas. Crossing the trail would be considered a use of a Section 4(f) property where the trails are located on accessible public lands.

#### **Function of the Property and Available Activities**

Figure 8 Lake Loop is a multi-use winter trail system. Available activities are similar to those described for the Lucky Shot Trail.

#### **Description of Existing and Planned Uses**

Figure 8 Lake Loop is part of a recreational trail system that supports a variety of winter sports in the MSB. The Figure 8 Lake Loop Trail does not have a recorded easement, but has been identified in the MSB Recreational Trails Plan (MSB 2008, as amended). In addition, the MSB owns and maintains a public parking area at the trailhead, just south of Point MacKenzie Road near the southern terminus of the proposed project.

#### **Access**

Parking is available at a trailhead parking lot owned and maintained by the MSB, located south of Point MacKenzie Road near the southern terminus of the proposed project. Access is also available from the Little Susitna River, various non-designated trails throughout the area, and many trails within the Susitna Flats State Game Refuge.

## **Relationship to other Similarly Used Lands in the Vicinity**

Although many trails exist to the north, as described here, the Point MacKenzie area has no officially recognized or recorded designated trails south of the Pipeline Trail. The Point MacKenzie area has numerous non-designated trails that are easily discernable from aerial photographs.

## **Applicable Clauses Affecting the Ownership**

The borough's Recreational Trails Plan (MSB 2008, as amended) recommends the survey and acquisition of a recreational trails easement for the Figure 8 Lake Loop Trail. Therefore, the Figure 8 Lake Loop Trail meets the definition of an officially recognized trail by MSB.

## **Point MacKenzie Recreational Trailhead Parking Area**

### **Size and Location**

The trailhead and associated parking area is south of Point MacKenzie Road, approximately 1 mile from the southern terminus of the proposed project (see Figure M-2). It is approximately 1 acre in size. The parking area would be crossed by and be within the terminal reserve area of the Mac West Segment.

### **Ownership and Type of Section 4(f) Property**

The parking area is owned by the MSB at the crossing point. The trail has been identified and is associated with the Figure 8 Lake Loop Trail in the MSB Recreational Trails Plan (MSB 2008, as amended). Construction of the Mac West Segment would require the conveyance of parking area land to ARRC and the conversion of the land to a different use. This would be considered a use of a Section 4(f) property.

### **Function of the Property and Available Activities**

The parking area is a main access point to the trailhead for individuals using the Figure 8 Lake Loop Trail, as well as numerous non-designated, unofficial, or unrecorded trails in the Point MacKenzie area.

### **Description of Existing and Planned Uses**

The parking area is intended to provide recreational access to the public and is part of a major recreational trail system that supports a variety of winter sports in Matanuska-Susitna Borough. No planned uses are known at this time.

### **Access**

The parking area is directly accessible via Point MacKenzie Road.

## **Relationship to other Similarly Used Lands in the Vicinity**

The MSB owns and maintains another trailhead parking area north of Ayrshire Road. ADNR manages the Little Susitna Public Use Facility within the northeast region of Susitna Flats State Game Refuge, where parking is also available for trail users.

## **Applicable Clauses Affecting the Ownership**

No applicable clauses are known at this time.

## **Flathorn Lake Trail**

### **Size and Location**

The Flathorn Lake Trail is a 20-mile-long multi-use winter trail that follows the Little Susitna Public Use Facility Access Road toward the Little Susitna River, before continuing west to Flathorn Lake (see Figure M-1 and Figure M-2). The trail would be crossed by Connector 1 Segment at the Susitna Flats State Game Refuge boundary, where the trail co-locates with the Public Use Facility Access Road.

### **Ownership and Type of Section 4(f) Property**

The point where the Flathorn Lake Trail would be crossed by Connector 1 Segment is publicly owned and managed by the ADNR. The trail has been identified in the MSB Recreational Trails Plan (MSB 2008, as amended). Crossing the trail would be considered a use of a Section 4(f) property where the trail is located on public land that is accessible to the public.

### **Function of the Property and Available Activities**

The Flathorn Lake Trail is a multi-use winter trail. Available activities are the similar to those described for the Lucky Shot Trail. This trail is also used for the annual Iron Dog Snowmobile Race.

### **Description of Existing and Planned Uses**

The Flathorn Lake Trail is part of a recreational trail system that supports a variety of winter sports in the MSB. The trail has a recorded easement reserved to the State of Alaska and the MSB (ADL 229108-B).

### **Access**

Access is available from Ayrshire Road/Little Susitna Public Use Facility Access Road, as well as the Iditarod-Pipeline Link Trail, the Iditarod Link Trail, Pipeline Trail, the Little Susitna River, the Susitna River, and numerous non-designated trails throughout the area.

## **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby, including the INHT, Iditarod Link Trail, Iditarod-Pipeline Link Trail, Pipeline Trail, and trails within Little Susitna State Recreation River. Many unofficial and/or unrecorded trails also exist throughout this area.

## **Applicable Clauses Affecting the Ownership**

Flathorn Lake Trail is an officially recognized trail with an easement held by the State of Alaska (ADL 229108-B) where it would be crossed by the proposed rail line.

## **Pipeline Trail**

### **Size and Location**

The Pipeline Trail is a 16.1-mile-long multi-use winter trail that follows a large gas pipeline corridor toward the Susitna River from the Point MacKenzie area. As illustrated in Figure M-2, it leads directly west from Ayrshire Road and crosses into the Susitna Flats State Game Refuge. The trail would be potentially crossed by Connector 1 Segment at the Susitna Flats State Game Refuge boundary, approximately 2 miles west of Guernsey Road.

### **Ownership and Type of Section 4(f) Property**

The Pipeline Trail is publicly owned and managed by the ADNR at the crossing point. The trail has been identified in the MSB Recreational Trails Plan (MSB 2008, as amended). Crossing the trail would be considered a use of a Section 4(f) property where the trails are located on accessible public lands.

### **Function of the Property and Available Activities**

The Pipeline Trail is a multi-use winter trail, and provides access to the Point MacKenzie area and the Susitna River. It is one of the main access points into the Susitna Flats State Game Refuge. Available activities are the similar to those described for the Lucky Shot Trail.

### **Description of Existing and Planned Uses**

The Pipeline Trail is part of a major recreational trail system that supports a variety of winter sports in the MSB.

### **Access**

Access is available from Ayrshire Road, Flathorn Lake Trail, Iditarod-Pipeline Link Trail, the Little Susitna River, the Susitna River, and other non-designated trails throughout the area.

## **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby, including the INHT, Flathorn Lake Trail, Iditarod-Pipeline Link Trail, Iditarod Link Trail, and trails within the Little Susitna State Recreation River and the



Susitna Flats State Game Refuge areas. Many unofficial and/or unrecorded trails also exist throughout this area.

### **Applicable Clauses Affecting the Ownership**

Pipeline Trail is an officially recognized trail with an easement held by the State of Alaska (ADL 229108-A) where it would be crossed by the proposed rail line.

## **Knik Connector Trail**

### **Size and Location**

The Knik Connector Trail (also known as Big Lake Trail #13) is a multi-use, winter trail that begins at a location on the W. Susitna Parkway approximately 0.1 mile west of the intersection with S. Purinton Parkway, and travels southeast for approximately 6.9 miles where it meets the Power Line and Tugs trails. As depicted in Figure M-2, the Knik Connector Trail would be crossed by the Big Lake Segment approximately 0.4 miles west of where the segment would cross Goose Creek.

### **Ownership and Type of Section 4(f) Property**

The Knik Connector Trail does not have a dedicated easement and is located on MSB property where it would be crossed by the Big Lake Segment. The trail has been identified in the MSB Recreational Trails Plan (MSB 2008, as amended). Crossing the trail would be considered a use of a Section 4(f) property where the trail is located on accessible public lands.

### **Function of the Property and Available Activities**

The Knik Connector Trail is a multi-use winter trail that, when considered with other trails in the area, provides access from Knik Township to the Susitna River. The trail mainly supports winter recreation activities.

### **Description of Existing and Planned Uses**

The Knik Connector Trail is part of a series of trails in the Big Lake Area. No planned uses are known at this time.

### **Access**

Access to the Knik Connector Trail is available from a trailhead on the W. Susitna Parkway located approximately 0.1 mile west of the intersection with S. Purinton Parkway. The trail can also be accessed from the Power Line and Tug trails.

### **Relationship to other Similarly Used Lands in the Vicinity**

Other trails exist in the vicinity including the INHT, the Aurora Dog Musers Trail System, 16 Mile Trail, Flat Lake Connector Trail, and Crooked Lake Trail. Many unofficial and/or unrecorded trails also exist throughout this area.

## **Applicable Clauses Affecting the Ownership**

Knik Connector Trail is an officially recognized trail included in the MSB Recreation Trails Plan as amended. The trail does not have a dedicated easement, though the MSB owns the property where the trail would be crossed by the Big Lake Segment.

## **16 Mile Trail**

### **Size and Location**

16 Mile Trail is a heavily used multi-purpose trail located approximately 2.3 miles southwest of Knik Township. As depicted in Figure M-2, the 16 Mile Trail would be crossed by the Big Lake Segment.

### **Ownership and Type of Section 4(f) Property**

16 Mile Trail is on state-owned land in locations where it would be crossed by the Big Lake Segment. The trail is considered a Section 4(f) resource because it is used for recreation and it provides access to other publicly-owned recreational areas.

### **Function of the Property and Available Activities**

16 Mile Trail is a multi-use trail that provides access from the Goose Creek Highway to the INHT and the Aurora Dog Musher's Trail System.

### **Description of Existing and Planned Uses**

16 Mile Trail is one of many trails found in the Knik and Big Lake areas. No planned uses are known at this time.

### **Access**

16 Mile Trail can be accessed from Goose Creek Highway, at a point approximately 2.3 miles southwest of Knik Township. It can also be accessed from the INHT and the Aurora Dog Musher's Trail System.

### **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby including INHT, Aurora Dog Musher's Trail System, and the Knik Connector Trail. Other unofficial and/or unrecorded trails also exist throughout this area.

## **Applicable Clauses Affecting the Ownership**

16 Mile Trail is an officially recognized trail with a platted right-of-way. The state of Alaska owns the property where the trail would be crossed by the Big Lake Segment.

## **Aurora Dog Musers Club Trail System**

### **Size and Location**

The Aurora Dog Musers Club Trail System (Aurora) is a series of non-motorized winter trails southeast of Big Lake (see Figure M-3) totaling 20.3 miles in length.

### **Ownership and Type of Section 4(f) Property**

Aurora is publicly owned by ADNR in locations where it would be crossed by the Big Lake Segment. The trails have been identified in the MSB Recreational Trails Plan (MSB 2008, as amended). The trail system is considered a Section 4(f) resource since its primary purpose is for recreation and it provides access to other publicly-owned recreational areas. Crossing the trails would be considered a use of a Section 4(f) property where the trails are located on public lands that are publicly available.

### **Function of the Property and Available Activities**

Aurora is a non-motorized winter trail system, and provides training and racing opportunities for dog sledgers, in particular. Other non-motorized activities are the similar to those described for the Lucky Shot Trail.

### **Description of Existing and Planned Uses**

Aurora is part of a recreational trail system that supports a variety of winter sports in the MSB. These trails also provide training and racing resources for dog sledding. The trail system has a recorded easement with the State of Alaska (ADL 228636); the MSB, the State of Alaska and Aurora Dog Musers Club have entered into a cooperative management agreement (Paulsen pers. comm., 2008).

### **Access**

Parking is available at the Aurora Dog Musers clubhouse on Gonder Road, accessible via Echo Lake Drive S. from South Big Lake Road. Additional access is available off Lewis Loop Road, from Knik-Goose Bay Road along the Iditarod Trail, and via other non-designated trails throughout the area.

### **Relationship to other Similarly Used Lands in the Vicinity**

Numerous trails exist nearby, including INHT, Threemile Lake Trail, and many unofficial and/or unrecorded trails located throughout this area. The only similar loop system that is heavily used in the project area is the West Gateway Trails near Willow. No other trails in the project area are designated as non-motorized.

### **Applicable Clauses Affecting the Ownership**

Aurora Dog Musers Club Trails have an established easement with the State of Alaska (ADL 228636), and a cooperative management agreement exists between the MSB, the State of Alaska

and the Aurora Dog Mushers Club. In December 2008, the MSB adopted the “Knik Sled Dog and Recreational Special Land Use District” for the southeastern portion of Knik-Fairview Community Council Area, which seeks to preserve and protect the existing activities and lifestyle of the area by restricting land uses. A portion of the Aurora Dog Mushers Club Trails passes through the new district.

## **Herning Trail**

### **Size and Location**

Herning Trail is a heavily used trail providing access from Knik Township to the Alaska Railroad. This trail is multi-use and is an important transportation corridor. As depicted in Figure M-2, Herning Trail would be crossed by the Big Lake Segment four times.

### **Ownership and Type of Section 4(f) Property**

Herning Trail is a publicly owned RS2477 trail. The trail is considered a Section 4(f) resource because it is used for recreation and at the southernmost point where it would be crossed by the Big Lake Segment, the land is owned by the MSB. (In the other crossing locations, the land is owned by private owners.)

### **Function of the Property and Available Activities**

Herning Trail provides transportation and recreation access between Knik Township and the Alaska Railroad. It is a heavily used, multi-purpose trail that is used for recreational snowmachining and dog sledding.

### **Description of Existing and Planned Uses**

Herning Trail is a RS2477 trail with a recorded easement with the State of Alaska (RST 1467). No planned uses are known at this time.

### **Access**

Access to the Herning Trail is available from Knik – Goose Bay Road in Knik Township as well as the Parks Highway near the area where it would be crossed by the Big Lake Segment. Access is also available via other non-designated trails throughout the area.

### **Relationship to other Similarly Used Lands in the Vicinity**

Other trails exist nearby, including the INHT and Aurora Dog Musher’s Trail System and many unofficial and/or unrecorded trails located throughout this area.

### **Applicable Clauses Affecting the Ownership**

Herning Trail has an established easement (RST 1467) and the property located where the trail would be crossed by the Big Lake Segment is owned by MSB.

### **M.1.c.2 Wildlife Refuges**

One wildlife refuge is located within the project area.

#### **Susitna Flats State Game Refuge**

##### **Size and Location**

The Susitna Flats State Game Refuge (Refuge) is located west of the Port MacKenzie Agricultural Project and east of the Susitna River. The Refuge includes approximately 300,800 acres (see Figure M-2). It would be affected by the Connector 1 Segment, Connector 2 Segment, Mac West Segment, and Willow Segment.

##### **Ownership and Type of Section 4(f) Property**

The Refuge is publicly owned and managed by the Alaska Department of Fish and Game (ADFG). Section 4(f) affords protection to publicly-owned wildlife refuges; therefore, this Refuge is considered a Section 4(f) resource. Crossing the Refuge would constitute a use of a Section 4(f) property.

##### **Function of the Property and Available Activities**

The Refuge provides habitat to a large migratory bird population, moose and bear habitat, and quality salmon rivers. It also provides public recreation opportunities including fishing, hunting, boating, wildlife viewing, and multi-use winter trails. The Refuge attracts sport fishermen, hunters, and trappers. The Little Susitna River runs north to south through the Refuge and offers opportunities for salmon harvest. Recreational users that engage in float trips that originate further upstream within the Little Susitna State Recreation River could also use the river within the Game Refuge. ADFG estimates that approximately 10 percent of all Alaska waterfowl harvest takes place within the Refuge, and approximately 45,000 angling days<sup>8</sup> are spent each year on the Little Susitna River (ADFG 1988).

The Susitna Flats State Game Refuge contains one public use facility that could be affected by the proposed rail line; a frequently used fishing, boating and camping site on the river called the Little Susitna Public Use Facility. This facility is located approximately 2 miles south of the point where the Willow Segment would cross the Little Susitna River. The Connector 1 Segment would run directly adjacent to its eastern boundary and the Little Susitna River is its western boundary. Public camping is available at the Little Susitna Public Use Facility, in the northeast area of the Refuge, as well as at several developed campsites along the banks of the Little Susitna River and at remote sites elsewhere within the Refuge.

##### **Description of Existing and Planned Uses**

The Susitna Flats State Game Refuge provides wildlife habitat and related recreation opportunities. No other known uses are planned at this time.

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<sup>8</sup> An angler-day is the time spent fishing by one person for any part of a day.

## **Access**

The main access point to the Refuge is via the Little Susitna Public Use Facility from Ayrshire Road. Individuals also have access to the Refuge via the Little Susitna River from the north (boating south from the Little Susitna State Recreation River or the Parks Highway) or the south (from the Little Susitna River or Susitna River). A number of trails lead into the Refuge from the Point MacKenzie area. These include the Figure 8 Lake Loop Trail, Pipeline Trail, Flathorn Lake Trail, Iditarod Link Trail, and Iditarod-Pipeline Link Trail. It is possible that individuals could also access the refuge via section line easements, though it is unlikely due to the lack of public parking areas and the privately-owned agricultural parcels that would have to be crossed to enter the refuge via section line easements (Paulsen pers. comm., 2009a). Another public access point to the refuge is located at the western terminus of Holstein Avenue (Paulsen pers. comm., 2009b). Private aircraft could also fly into the Refuge, landing on its many lakes.

## **Relationship to other Similarly Used Lands in the Vicinity**

There are two wildlife refuges in proximity. The Goose Bay State Game Refuge provides similar features several miles to the east, on the western shore of the Knik Arm. The Palmer Hay Flats State Game Refuge is located at the northeast end of the Knik Arm, north of Anchorage. Some of the recreation opportunities within the Susitna Flats State Game Refuge are available in adjacent public areas, including the Nancy Lake State Recreation Area, the Willow Creek State Recreation Area, and the Little Susitna State Recreation River.

## **Applicable Clauses Affecting the Ownership**

Though not commonly used for that purpose, section lines may provide access into refuge from the east. AS 11 AAC 51.025 establishes that ADNR will reserve a 50- to 100-foot public easement along section lines before selling, leasing, or otherwise disposing of the surveyed land estate, unless and until it is vacated under 11 AAC 51.065. Section line easements leading to public or navigable water are not to be vacated.

### **M.1.c.3 Cultural Resource Areas**

SEA considered the Area of Potential Effects (APE) for cultural resources potentially affected, directly or indirectly, by the proposed project. Examination of potential impacts on cultural resources included consideration of aspects of the area's landscape as a whole, including several cultural and historical components that could constitute cultural landscapes or Traditional Cultural Properties (TCPs). These include homesteads, dog sledding, agriculture, and recreation. Cultural landscapes were researched and evaluated based on their potential eligibility for inclusion on the National Register as either districts or sites.

Based on a literature review, analysis of the Alaska Heritage Resources Survey (AHRS) database (ADNR 2008b) and other databases and fieldwork, SEA identified known cultural resources and mapped their location relative to the proposed rail alternatives. APEs were defined to encompass the extent of potential direct, indirect, and cumulative effects of the proposed rail extension that could cause alterations in the character or use of cultural resources that may be eligible for the National Register. SEA initiated government-to-government consultation with 10 Federally Recognized Tribes, tribal groups, and Alaska Native Regional Corporations for identification of

any potential traditional cultural properties in the study area. Consultation letters and meetings asked interested parties to identify their concerns regarding cultural resources in the study area, as well as to identify any cultural resources in the study area not documented during the literature and Alaska Heritage Resources Survey review and SEA field surveys. A full description of cultural resources findings and the analysis process can be found in Chapter 6 of the Draft EIS.

The APE for direct effects, other than for visual effects, included the 200-foot-wide ROW as well as areas where noise levels could increase and the ground would be disturbed such as staging areas, cut and fill areas, material sources/gravel quarries, overburden disposal areas, associated buildings/structures (e.g., sidings, bridges), and associated infrastructure (e.g., communication towers, power lines). The APE considered for indirect effects as well as for direct visual effects included cultural resources within a mile on either side of the ROW centerline.

Research findings and surveys identified 56 known prehistoric sites and 22 historic cultural sites within 1 mile of the ROW. Of these, only one historic site was determined to be eligible for inclusion on the National Register in the preliminary analysis. One historic bridge (Iron Creek Bridge over Willow Creek) has been determined eligible for National Register inclusion, and one historic bridge has been replaced with a new structure and is not eligible. However, the Iron Creek Bridge (Alaska Railroad Mile Post 187.7) is located almost 0.8 mile south of the location where the Willow Segment would tie into the ARRC mainline; therefore, the Iron Creek Bridge would not be affected by the construction or operation of the proposed rail extension and is not considered a Section 4(f) resource that would be affected by the project. The National Register eligibility has not yet been determined for all prehistoric sites and all but one historic site. Government-to-government or NHPA Section 106 consultation did not identify any traditional cultural properties in the study area.

All properties identified in the cultural resources analysis are presumed to be eligible for inclusion on the National Register unless otherwise specified or until a formal determination of eligibility is made. A number of the prehistoric and historic resources may be eligible for inclusion. Determination of eligibility for known and unknown sites will be handled through a Programmatic Agreement (PA) (see Appendix J of the Draft EIS for the draft PA).

### **Iditarod National Historic Trail**

The Iditarod National Historic Trail (INHT) was established in 1978 when the National Trails Act of 1968 (Public Law 90-534) was amended to include National Historic Trails. The National Trails Act states that National Historic Trails including lands and sites located along a National Historic Trail are not eligible for review under Section 4(f) [16 U.S.C. 1246(g)]<sup>9</sup>.

...[N]o land or site located along a designated national historic trail... shall be subject to the provisions of section 4(f) of the Department of Transportation Act (49 U.S.C. 1653(f)) unless such land or site is deemed to be of historical significance under appropriate historical site criteria such as those for the National Register of Historic Places.

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<sup>9</sup> This provision is also found in 23 CFR 774.13(f)(2).

Historic sections of the trail and historic sites associated with the trail may be subject to Section 4(f) if deemed historically significant; however, the portion of the trail in question for this project (Knik to Susitna River) is considered ineligible for inclusion on the National Register as a historic trail segment according to the Iditarod National Historic Trail Comprehensive Management Plan (BLM, 1986) and is therefore not subject to the provisions of Section 4(f) under this condition<sup>10</sup>.

The cultural resources analysis conducted through the Section 106 process for the proposed rail extension identified dog sledding associated with the INHT including improvements made from 1967 through 1978 for the Iditarod Race as a cultural landscape potentially eligible for inclusion on the National Register. A full determination of eligibility would require fieldwork to evaluate the cultural landscape's integrity, which would be conducted according to the stipulations of the Programmatic Agreement being prepared for compliance with NHPA Section 106.

If during construction of the proposed rail line, potentially eligible sites along the INHT are identified as being potentially affected, evaluations of National Register eligibility and potential protection under Section 4(f) would be addressed as described in the Programmatic Agreement (See Appendix J of the Draft EIS).

#### **M.1.d Impacts to Section 4(f) Resources**

Potential impacts to Section 4(f) resources were evaluated for each proposed rail line segment. This section describes the potential impacts to recreation and refuge properties and cultural resources as a result of the proposed project.

##### **M.1.d.1 Parks and Recreation Areas**

##### **Impacts Common to All Areas**

Some project impacts would be common to all segments analyzed. Construction would result in a temporary suspension of recreational activities in the immediate vicinity of the railroad as individuals attempting to access recreation areas and resources via trails and waterways would be temporarily impeded. Areas of active construction work in proximity to recreation resource areas could also result in increased dust. Construction activities could result in temporary impacts to water quality, which could affect recreational fishing. Construction activities could result in the temporary alteration of local distribution of wildlife, which could affect the experience of users engaging in recreational hunting and wildlife viewing. Construction and operation would result in the clearing and maintenance of all or a portion of the proposed 200-foot-wide ROW. In forested areas, this would result in a visible line of deforestation along the ROW, and could reduce user enjoyment of recreation areas where cleared vegetation would be a discordant element of the landscape. Vegetation clearance could decrease the productivity of habitat for purposes of fishing, hunting, trapping, and wildlife viewing by removing or fragmenting habitat; however, there is sufficient habitat in the study area to absorb any displaced species. Operation of the railroad would introduce an additional source of intermittent noise.

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<sup>10</sup> In a letter dated December 31, 2009, the ADNR provided comments on SEA's Section 4(f) Evaluation and suggested that the Knik – Susitna Trail be considered under Section 4(f) provisions due to its recreational and historic value. Because of the provisions of Federal statutes and regulations, it is not considered a 4(f) resource.



The finished ROW could act as a physical barrier across public lands and could only be legally crossed at designated crossing points (for roads, trails, and navigable waters).

A summary of the potential impacts under various alternatives is provided in Section M.1.d.4. For a detailed discussion of impacts on the Section 4(f) resources, please see below.

### **Little Susitna State Recreation River**

The Willow Segment would cross through the southwestern corner of the Little Susitna State Recreation River and would cross the Little Susitna River in the Susitna Flats State Game Refuge, just south of the Little Susitna State Recreation River. The Houston North Segment would also cross the Little Susitna River, though its crossing would be further upriver near the northern part of the Recreation River and the George Parks Highway. The Houston North and Willow segments would introduce new crossings of the Little Susitna River, which could present visual intrusions on the landscape. In addition, the Houston South Segment would cross the Little Susitna River on a new bridge to be constructed within the existing railroad mainline ROW, adjacent to the Little Susitna State Recreation River. Although the new bridge crossings would not interfere with navigation of the river, they could affect sportfishing resources and recreational access (via boat and upland), and user enjoyment of the natural environment. In addition, Houston North would cross the Nancy Lake Creek Junction Public Use Site, a popular camping and fishing location. Within the 200-foot-wide ROW this site would require the conversion of any public-use facility land to other use. SEA estimated the area within the Little Susitna State Recreation River where the potential noise impact would be considered “severe” based on FRA criteria<sup>11</sup> and compared the estimated affected area within this Section 4(f) property to the total area of the property. The acreage of potential noise impacts within the Little Susitna Recreation River would range from 450 acres (for alternatives that include the Willow Segment) to 769 acres (for alternatives that include the Houston North Segment) of the total area of the recreation river. These areas of impact correspond to 3 percent to 4 percent of the total area of the recreation river<sup>12</sup>.

#### **Direct Use**

Permanent acquisition under various alternatives of the proposed project would result in the direct use of the Section 4(f) Resource, i.e. Little Susitna State Recreation River. Permanent acquisition would include 17 acres of the southern part of the Recreation River for the Willow Segment and 69 acres in the northeastern part of the Recreation River for Houston North.

#### **Temporary Use**

Where practicable, ARRC would site construction staging areas inside the 200-foot ROW. Any disturbance outside this ROW due to construction activities would be for a short duration and

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<sup>11</sup> Based on FRA criteria, noise levels that would cause a “severe” impact depend on the ambient noise level and the type of land use. For this analysis, the Section 4(f) properties were considered to be in land use Category 3 (for primarily daytime and evening use) except for camping areas, which were considered to be a Category 1 (where quiet is an essential element in their intended purpose). The increase in noise that would constitute a “severe” impact for each land use depends on the ambient noise level and is defined in Table 3-1 of the FRA impact assessment document (FRA, 2005)

<sup>12</sup> See Section 9.2 of the Draft EIS for additional explanation of the methodology used to evaluate noise impacts on Section 4(f) properties.

would not result in change in ownership or require a permanent easement or property interest, and, therefore, would not amount to a use of the Section 4(f) resource.

### **Finding**

The ROW for the Houston North Segment would impact 0.4 percent of the Little Susitna State Recreation River's total area (17,459 acres) and noise from rail operations would affect approximately 4 percent of the recreation river. The additional bridge crossing of the Little Susitna River required for the Houston North Segment within the Recreation River and the associated noise from train operations would detract from the qualities of float trips and other recreational uses of the Little Susitna River. Therefore, FRA and SEA anticipate that the Houston North Segment would result in adverse impacts to the Little Susitna State Recreation River. In contrast, with the recommended preliminary measures to minimize harm and mitigate impacts (as described in Section M.1.f), FRA and SEA have found that the Houston South Segment bridge over the Little Susitna River within the existing ARRC ROW would not adversely affect the Recreation River. The Willow Segment would not require a crossing of the Little Susitna River or any trails or know recreational facilities within the Little Susitna State Recreation River. The ROW for the Willow Segment would impact 0.1 percent of the recreation river and noise from rail operations would affect approximately 3 percent of the recreation river. In their letter dated December 31, 2009, ADNRC indicated that the Willow Segment would result in adverse impacts to the Little Susitna State Recreation River and that the measures designed to mitigate these impacts would not support a *de minimis* impact finding for this resource.

### **Nancy Lake State Recreation Area**

The Willow Segment would cross a 12-acre portion of this area west of Red Shirt Lake (approximately 0.05 percent of total parkland). No known trails, campsites, or other active recreation sites are known within the ROW where it would cross the Nancy Lake Recreation Area; however the rail line could affect enjoyment of the natural setting if users visit this area. SEA estimated the area within the Nancy Lake State Recreation Area where the potential noise impact resulting from the operation of the Willow Segment would be considered "severe" based on FRA criteria, would be approximately 219 acres. This area constitutes less than 1 percent of the total area. Approximately 20 acres within the Nancy Lake State Recreation Area (or 0.09 percent of total parkland) west of the railroad ROW would be separated from the rest of the park (see Figure M-4) unless rail crossings were provided. However, there are no facilities or specific resources within this area that would be adversely affected, according to park personnel (Biessel pers. comm., 2009).

### **Direct Use**

Permanent acquisition of 12 acres under the Willow Segment would constitute a direct use of the Nancy Lake State Recreation Area, a Section 4(f) resource. This area would be located in a corner of the Recreation Area without known facilities or unique resources.

### **Temporary Use**

Where practicable, ARRC would site construction staging areas inside the 200-foot ROW. Any disturbance outside this ROW due to construction activities would be for a short duration and

would not result in change in ownership or require a permanent easement or property interest, and, therefore, would not amount to use of the Section 4(f) resource.

### **Finding**

The ROW for the Willow Segment would affect 0.14 percent of the Nancy Lake State Recreation Area and noise from train operations would affect approximately 1 percent of the SRA. No unique recreational opportunities would be lost. As indicated in their letter dated December 31, 2009, however, ADNR has indicated that the Willow Segment would have an adverse impact on the Nancy Lake State Recreation Area that would not be rendered *de minimis* by mitigation.

### **Willow Creek State Recreation Area**

The ROW for the Willow Segment would bisect the Willow Creek State Recreation Area north to south, affecting approximately 43 acres, approximately 1.4 percent of the recreation area. The Willow Segment could affect recreational activities within the park, including hiking along various trails, sport fishing, snowmachining, dog sledding, and general user enjoyment. The segment would cross the Willow Valley and Willow Creek by a bridge requiring in-stream pilings, which could adversely affect sportfishing resources via loss of spawning habitat. Such a structure would alter the landscape of the Willow Valley. Train traffic noise would be audible to users within the Willow Creek State Recreation Area if they are in the vicinity of the rail line when a train passes by. The estimated acreage of potential noise impacts within the Willow Creek State Recreation Area where the potential noise impact would be considered “severe” based on FRA criteria is 334 acres – approximately 9 percent of the total acreage. Within the park, the railroad would cross approximately 792 feet of the Lucky Shot Trail, which is an officially recognized trail that would receive a grade-separated crossing as proposed by ARRC. This trail is frequented by professional athletes in training as well as recreational users and is an integral part of the Willow Creek State Recreation Area trails (Biessel pers. comm., 2009).

### **Direct Use**

Permanent acquisition of 43 acres for the Willow Segment would result in a direct use of the Willow Creek State Recreation Area, a Section 4(f) resource.

### **Temporary Use**

Where practicable, ARRC would site construction staging areas inside the 200-foot ROW. Any disturbance outside this ROW due to construction activities would be for a short duration and would not result in change in ownership or require a permanent easement or property interest. Therefore this would not amount to use of the Section 4(f) resource.

### **Finding**

The ROW of the Willow Segment would affect 1.4 percent of the recreation area and would potentially alter sportfishing access and resources. Noise from train operations would affect approximately 9 percent of the recreation area. Measures could be implemented to minimize harm and mitigate impacts (as described in Section M.1.f). However, the presences of a rail line bisecting the Recreation Area would constitute a major feature that would change the attributes

and character of the resource. Therefore, FRA and SEA anticipate, consistent with ADNR's determination, that the potential impacts from the Willow Segment on the Willow Creek State Recreation Area not be *de minimis*.

### **Officially Recognized Trails**

Where the proposed rail line would cross a trail whose status is officially recognized, ARRC proposes to provide continued public access by installing a grade-separated crossing where practicable, or the trail could be relocated to avoid crossing the rail line, providing continuity for these trails and minimizing the impact of the rail crossing. The design of the crossing would accommodate existing trail users at the time of construction or ROW conveyance (whichever occurs first). The Applicant would coordinate with the trail owner and consult with user groups as appropriate where the crossing location may have to be relocated to accommodate a grade-separation, or multiple crossings within one mile might be consolidated. ARRC does not propose to provide crossings for unofficial trails. Unofficial trails would be blocked, and ARRC's trespassing regulations would prohibit the public from crossing of the ROW without first obtaining approval from ARRC. Officially recognized Section 4(f) trails where crossings would occur, depending on the rail segment, at locations where the easement and/or land is publicly owned, include the West Gateway Trail, Lake Trail, Nancy Lake – Susitna Trail, Iron Dog Trail, Crooked Lake Trail, Iditarod Link Trail, Flathorn Lake Trail, Pipeline Trail, Knik Connector Trail, 16 Mile Trail, Aurora Dog Musher's Trails, Herning Trail, and the Figure 8 Lake Loop Trail. With grade-separated crossings of these trails, recreational access would be retained after project-related construction. However, by altering the natural setting of the trails, crossings could affect user enjoyment of the trails.

These trails would be closed temporarily during construction and crossings could be relocated or consolidated with other trails if they exist nearby to reduce the number of crossings of the rail line in proximity to one another. Trail closures, though temporary, could affect user enjoyment though ARRC would time construction activities during the most appropriate timeframe to limit impacts to trails. Table M-1 indicates which officially recognized trails identified at this time would be crossed by the proposed rail line segments. Impacts such as closure of trails during construction would be temporary and would not result in permanent impairment of the features of the resource that qualify it as a Section 4(f) resource.

### **Direct Use**

The Willow Segment would cross approximately, 206 feet of the West Gateway Trail, 203 feet of the Mud Lake Trail, 260 feet of the Nancy Lake – Susitna Trail, 218 feet of the Iron Dog Trail, 212 feet of the Crooked Lake Trail, and 206 feet of the Iditarod Link Trail. Connector 1 Segment would cross approximately 211 feet of the Flathorn Lake Trail, 200 feet of the Pipeline Trail, and 211 feet of the Iditarod Link Trail. The Big Lake Segment would cross approximately 206 feet of 16 Mile Trail, 262 feet of the Knik Connector Trail, 663 feet of the Aurora Dog Musher's Trail System,<sup>13</sup> and 1,277 feet of Herning Trail. The Mac West Segment (including the terminal reserve) would cross approximately 1,664 feet of the Figure 8 Lake Loop Trail. These crossings would result in a direct use of these Section 4(f) resources.

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<sup>13</sup> The Aurora Trails roughly co-locate with the Iditarod National Historic Trail at one point. The potentially affected trail length would be the same for both trail systems at this point.

**Table M-1**  
**Officially Recognized Trails Identified as Section 4(f) Resources Crossed by Rail Line Segment Right-of-Ways**

<b>Rail Line Segment</b>	<b>Trails</b>
Mac West	Figure 8 Lake Loop
Mac East	None
Connector 1	Pipeline; Flathorn Lake; Iditarod Link
Connector 2	None
Connector 3	None
Willow	Iditarod Link; Crooked Lake; Iron Dog; Nancy Lake – Susitna; Mud Lake; West Gateway;
Houston	Crooked Lake
Houston North	None
Houston South	None
Big Lake	Knik Connector; 16 Mile; Aurora Dog Mushers Club; Herning

### **Temporary Use**

During construction for the project and the grade-separated crossings, temporary closure of these trails or detours may be necessary. This would not result in change in ownership or require a permanent easement or property interest. Therefore, construction would not constitute a use of the trails that are Section 4(f) resources.

### **Finding**

Based on the analysis of impacts, SEA and FRA anticipate that the project, including mitigation measures listed in M.1.f, would not have an adverse effect on the activities, features, and attributes of the trails, and therefore, these trails would experience *de minimis* impacts as a result of the proposed rail line.

### **Point MacKenzie Trailhead Parking Area**

The parking area would be crossed by and located within the terminal reserve area of the Mac West Segment and, therefore, access to Figure 8 Lake Loop and other area trails would be adversely affected due to diminished public parking.

### **Direct Use**

Under the Mac West Segment, the parking area for the Point MacKenzie Trailhead would be permanently acquired. This would constitute direct use of the Section 4(f) resource.

## **Temporary Use**

During construction and relocation of the trailhead and parking area, a temporary closure of the existing trailhead and a temporary loss of public parking and access to the Figure 8 Lake Loop Trail could occur. This would only last for a short time and would not constitute a use of the Section 4(f) resource.

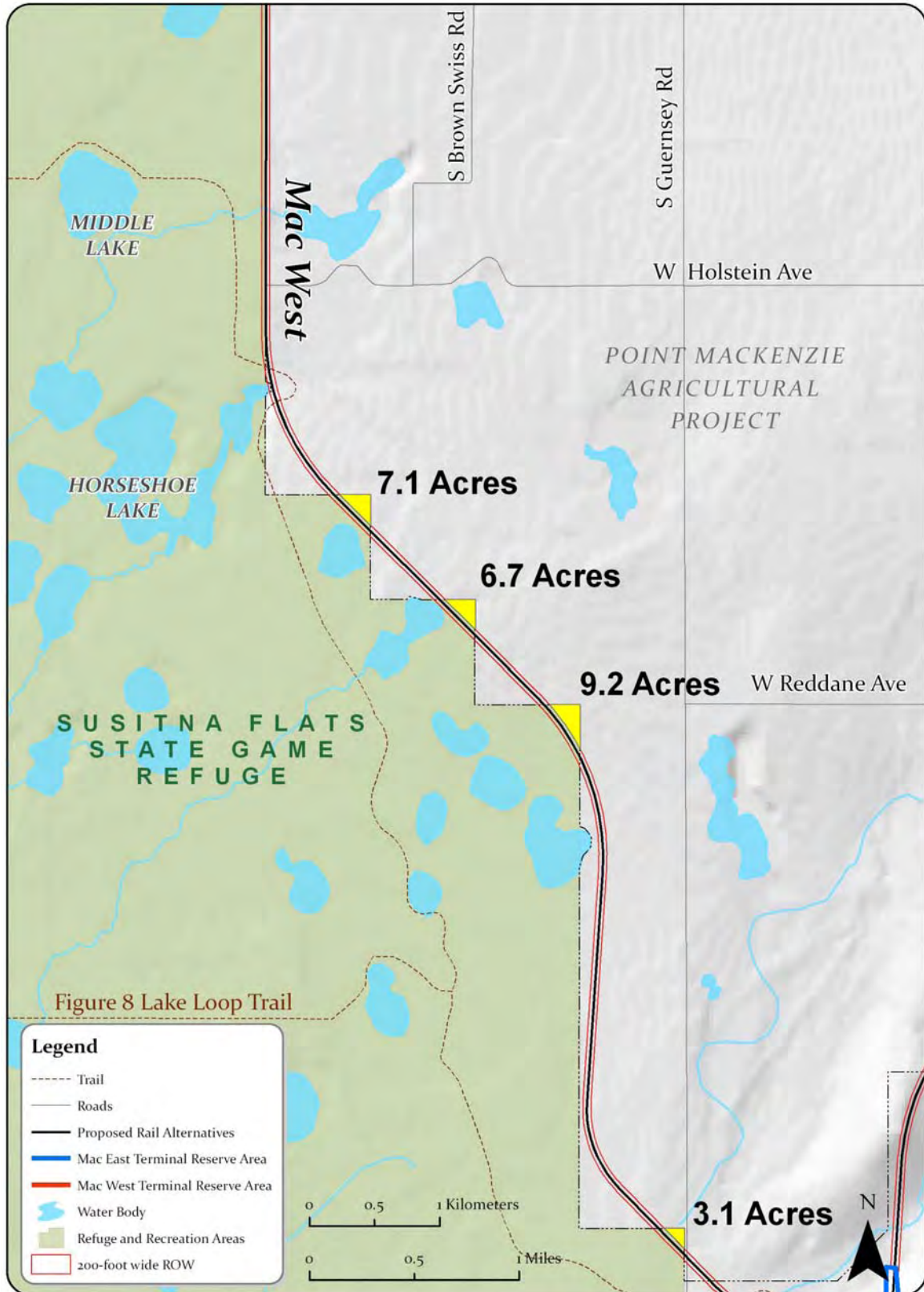
## **Finding**

If the Mac West Segment was constructed and the recommended preliminary measures to minimize harm described in Section M.1.f.1 were implemented, the parking lot and trailhead would be relocated and continued access to the Figure 8 Lake Loop Trail would be ensured. With this mitigation, SEA and FRA anticipate, consistent with MSB's determination (see letter dated February 1, 2010), that the proposed Mac West Segment would result in a *de minimis* impact to the Point MacKenzie Trailhead and Parking Lot. These findings include recommended preliminary measures to minimize harm and mitigate impacts (as described in Section M.1.f) to ensure that the project does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f).

### **M.1.d.2 Wildlife Refuges**

#### **Susitna Flats State Game Refuge**

The common impacts listed above for recreation areas would also apply for the Susitna Flats State Game Refuge. The Mac West, Connector 1 Segment, Connector 2 Segment and Willow segments would each require use of some Refuge land. The Willow Segment would cross the Little Susitna River within the Refuge boundary and could potentially affect sport fishing and recreational access as well as user enjoyment of the river in this location. The northern and western boundaries of the state game refuge are undeveloped, while the eastern boundary of the refuge, which generally follows the Mac West Segment and Connector 1 Segment, includes several access points to the refuge. The Iditarod Link, Pipeline, Flathorn Lake, and Figure 8 Lake Loop trails would continue to provide access to the Refuge via grade-separated trail crossings, as proposed by the Applicant. Other trails providing access to the Refuge that do not have recorded easements – including the trail at the western end of Holstein Avenue – would be closed where they are crossed by a rail line ROW. These could include section line easements on the west side of the Point MacKenzie Agricultural Project. However, it is unlikely that section line easements would be used to access the Game Refuge due to the lack of public parking areas and the privately-owned agricultural parcels that would have to be crossed to enter the Refuge (Paulsen pers. comm., 2009a). Train traffic noise would be audible to users within the Susitna Flats State Game Refuge if they are in the vicinity of the rail line when a train passes by. The estimated acreage of potential noise impacts within the Susitna Flats State Game Refuge where the potential noise impact would be considered “severe” based on FRA criteria is less than 1 percent of the total acreage of the refuge, though total acreage potentially affected would range from 0 to 1,762 acres, depending on the alternative. In addition to the area of the refuge that the Mac West Segment would directly affect, it would also cut through and effectively separate 26 acres from four small corners of the refuge located southeast of Horseshoe Lake (see Figure M-



**Figure M-5. Areas Dislocated from the Susitna Flats State Game Refuge by the Mac West Segment**

5). This area constitutes 0.01 percent of the Refuge and is not known to contain official trails, campsites, or other active recreational facilities.

### **Direct Use**

The potentially affected acreage of crossing areas is estimated as follows: Connector 1 Segment – 36 acres; Connector 2 Segment – 1 acre; Mac West – 54 acres; Willow – 7 acres. Although this reduction in habitat could affect user experience and recreational enjoyment, the affected acreage is a small fraction of the total 300,800-acre Refuge. In terms of possible alternatives affecting the Refuge, the Mac West-Connector 1-Willow Alternative would include 97 acres of Refuge land (0.03 percent of the total); the Mac West-Connector 2-Big Lake Alternative would include 56 acres (0.018 percent of the total); the Mac West-Connector 1-Houston-Houston North Alternative would include 91 acres (0.03 percent of the total); and the Mac West-Connector 1-Houston-Houston South would include 91 acres (0.03 percent of the total). Permanent conversion of lands within the Refuge could negatively affect user enjoyment of the natural setting and would result in a direct use of the Section 4(f) resource.

### **Temporary Use**

Where practicable, ARRC would site construction staging areas inside the 200-foot ROW. Any disturbance outside this ROW due to construction activities would be for a short duration and though it could lead to negative, temporary impacts to user enjoyment of these areas, it would not result in a change in ownership or require a permanent easement or property interest and, therefore, would not amount to a use of the Section 4(f) resource.

### **Findings**

The maximum area of the Susitna Flats State Game Refuge that could be affected by the rail line ROW would constitute 0.04 percent of the total area and major access points would be retained. The Mac West Segment, Willow Segment, and Connector 1 Segment would not result in loss of unique recreational opportunities. Noise from rail operations on the Willow Segment would affect approximately 273 acres, while the Connector 1 Segment would affect approximately 497 acres and the Mac West Segment would affect approximately 992 acres. FRA and SEA have recommended preliminary measures intended to minimize harm and mitigate potential impacts (as described in Section M.1.f). In its letter dated December 31, 2009, ADNR indicated that the Mac West Segment, Willow Segment, and Connector 1 Segment would result in adverse impacts to the Susitna Flats State Game Refuge due to the limiting of access to the only legally-constructed access road – Ayrshire Ave/Little-Su River Road – while other informal access routes would be restricted. ADNR also indicated that no conceivable assemblage of mitigation measures would decrease impacts from the Mac West, Connector 1, and Willow segments to a level that would be *de minimis*.

#### **M.1.d.3 Cultural Resource Areas**

The cultural resources analysis identified dog sledding associated with the INHT and Iditarod Race as a cultural landscape potentially eligible for inclusion on the National Register. A full determination of eligibility would require fieldwork to evaluate the cultural landscape's integrity,



which would be conducted according to the stipulations of the Programmatic Agreement being prepared for compliance with NHPA Section 106 (see Appendix J of this Draft EIS).

A preliminary boundary for the dog sledding landscape includes the trail network in the study area associated with the historic trail and race and the buildings and locations that contribute to the historical context of this landscape, including the Aurora Dog Mushers Club, Knik Kennels, Knik Museum and Dog Mushers Hall of Fame, and Iditarod Trail Sled Dog Race Headquarters. Other existing dog sledding landscape characteristics in the study area include dog sledding trails and kennels for which a full inventory has not been completed. Trails contributing to a potential dog sledding cultural landscape could be temporarily blocked during construction or permanently blocked by the rail line, which could result in trail abandonment or route changes. Changes to trails could cause the loss of access to or use of the trails and associated historic landscapes and properties. Adverse effects to the dog sledding cultural landscape could occur to varying degrees through loss of visual integrity, cultural privacy, potential loss of or changes to access, and changes to traditional or culturally significant use of and connection to the property.

Other known historic and prehistoric resources could be affected by construction of the project. The National Register eligibility of these resources has not been determined; they are not reviewed for Section 4(f) analysis based on the requirement that resources be on or eligible for the National Register. If, during construction of the proposed rail line, potentially eligible sites along the railroad ROW or associated with the INHT were identified as being potentially affected, evaluations of National Register eligibility and potential protection under Section 4(f) would be addressed based on the Programmatic Agreement and preliminary mitigation measures.

#### **M.1.d.4 Summary of Impacts to Section 4(f) Resources**

Table M-2 provides a comparison of impacts to Section 4(f) resources by alternative. Effects to trails were measured in linear feet of impact and the number of recreation access route intersections and impacts to recreation areas was measured by the number of acres affected.

Cultural resource areas are presented by the number of confirmed historic sites potentially affected by the project.

#### **M.1.e Avoidance Alternatives**

This section provides a discussion of avoidance alternatives considered early in the project development process and potential avoidance techniques applied to the alternatives considered in detail in the EIS.

All alternatives considered in this analysis are considered feasible because they can be designed and built. An alternative that is not prudent could be eliminated from consideration for the following reasons:

- It involves extraordinary operational or safety problems;
- There are unique problems or truly unusual factors present with it;

- It results in unacceptable and severe adverse social, economic or other environmental impacts;
- It would cause extraordinary community disruption;
- It has additional construction costs of an extraordinary magnitude; or
- There is an accumulation of factors that collectively, rather than individually, have adverse impacts that present unique problems or reach extraordinary magnitudes.

SEA and FRA anticipate, based on analysis of potential impacts and consultation with owning agencies, that the construction and operation of the proposed rail line – in conjunction with the implementation of the Applicant’s voluntary mitigation measures and SEA’s recommended preliminary mitigation measures – would result in *de minimis* impacts to: the West Gateway Trail; Iron Dog Trail; Herning Trail; Knik Connector Trail; 16 Mile Trail; Crooked Lake Trail; Iditarod Link Trail; Aurora Dog Mushers Trails; Port MacKenzie Trailhead and Parking Lot; and Figure 8 Lake Loop Trail. Therefore, an analysis of alternatives that would avoid these particular 4(f) resources is not required in accordance with Section 009(a) of the SAFETEA-LU. One or more segments of the proposed rail line would adversely affect the Susitna Flats State Game Refuge, the Nancy Lake State Recreation Area, Willow Creek State Recreation Area and the Little Susitna State Recreation River. Avoidance of these 4(f) resources is described in M.1.e.2 below.

#### **M.1.e.1 Alternatives Eliminated from Detailed Study**

A number of alternatives were considered early in the National Environmental Policy Act (NEPA) process but were eliminated from further consideration. Chapter 2 of the Draft EIS discusses the process of narrowing the alternatives and Table 2-1 summarizes alternatives eliminated from consideration. None of those alternatives provide a clear advantage under the criteria of Section 4(f) for avoidance or minimization of Section 4(f) uses.

#### **M.1.e.2 Avoidance Techniques**

SEA and FRA anticipate, as a result of analyses and consultation with owning agencies that: the Mac West, Willow, and Connector 1 segments would result in *adverse* impacts to the Susitna Flats State Game Refuge; the Willow Segment also would result in *adverse* impacts to the Little Susitna Recreation River, the Nancy Lakes State Recreation Area, and the Willow Creek State Recreation Area; and the Houston North Segment would result in *adverse* impacts to the Little Susitna State Recreation River. Alternatives that exclude the Mac West, Connector 1, Willow, and Houston North segments would avoid other than *de minimis* impacts to these resources with the implementation of the measures to minimize harm described below.

**Table M-2**  
**Comparison of Potential 4(f) Impacts by Alternative (page 1 of 3)**

<b>Alternative</b>	<b>Section 4(f) Resources and Areas Potentially Impacted<sup>a</sup></b>	<b>Number of Known 4(f) Recreational Trails Crossed<sup>b</sup></b>	<b>Total Potentially Impacted ROW Acreage - Recreation Areas<sup>c</sup></b>	<b>Total Potentially Impacted ROW Acreage - Wildlife Refuge<sup>c</sup></b>	<b>Total Potentially Impacted Recreational Trail Length (feet)<sup>d</sup></b>	<b>Estimated Potential Noise Impact to Section 4(f) Properties (Acres)</b>
Mac West – Connector 1 – Willow	<b>Parks &amp; Recreation Areas:</b> Willow Creek State Recreation Area (43.3 acres); Nancy Lake State Recreation Area (12.4 acres); Little Susitna State Recreation River (17.3 acres); Point MacKenzie Trailhead and Parking Lot (1.33 acres); West Gateway Trail (206 feet); Mud Lake Trail (203 feet); Nancy Lake – Susitna Trail (260 feet); Iron Dog Trail (218 feet); Crooked Lake Trail (212 feet); Iditarod Link Trail (221 feet); Flathorn Lake Trail (211 feet); Pipeline Trail (200 feet); Figure 8 Lake Loop Trail (1,664 feet); Wildlife Refuges: Susitna Flats State Game Refuge (97.1 acres)	9	94	123	3,395	2,765
	<b>Parks &amp; Recreation Areas:</b> Little Susitna State Recreation River (69 acres); Point MacKenzie Trailhead and Parking Lot (1.33 acres); Crooked Lake Trail (204 feet); Flathorn Lake Trail (211 feet); Pipeline Trail (200 feet); Figure 8 Lake Loop Trail (1,664 feet); Iditarod Link Trail (221 feet); Wildlife Refuges: Susitna Flats State Game Refuge (90.6 acres)	5	70	117	2,626	2,258
Mac West – Connector 1 – Houston–Houston North	<b>Parks &amp; Recreation Areas:</b> Point MacKenzie Trailhead and Parking Lot (1.33 acres); Crooked Lake Trail (204 feet); Flathorn Lake Trail (211 feet); Pipeline Trail (200 feet); Figure 8 Lake Loop Trail (1,664 feet); Iditarod Link Trail (211 feet); Wildlife Refuges: Susitna Flats State Game Refuge (90.6 acres)	4	5	114	2,490	1,489

**Table M-2**  
**Comparison of Potential 4(f) Impacts by Alternative (page 2 of 3)**

<b>Alternative</b>	<b>Section 4(f) Resources and Areas Potentially Impacted<sup>a</sup></b>	<b>Number of Known 4(f) Recreational Trails Crossed<sup>b</sup></b>	<b>Total Potentially Impacted ROW Acreage - Recreation Areas<sup>c</sup></b>	<b>Total Potentially Impacted ROW Acreage - Wildlife Refuge<sup>c</sup></b>	<b>Total Potentially Impacted Recreational Trail Length (feet)<sup>d</sup></b>	<b>Estimated Potential Noise Impact to Section 4(f) Properties (Acres)</b>
<b>Parks &amp; Recreation Areas:</b> Point MacKenzie Trailhead and Parking Lot (1.33 acres); Knik Connector Trail (262 feet); 16 Mile Trail (206 feet); Aurora Dog Mushers Club Trails (663 feet); Herning Trail (1,277 feet); Figure 8 Lake Loop Trail (964 feet); Wildlife Refuges: Susitna Flats State Game Refuge (55.5 acres)						
Mac West – Connector 2 – Big Lake		5	1	82	3,372	992
<b>Parks &amp; Recreation Areas:</b> Willow Creek State Recreation Area (43.3 acres); Nancy Lake State Recreation Area (12.4 acres direct use, 19.5 acres constructive use); Little Susitna State Recreation River (17.3 acres); West Gateway Trail (206 feet); Mud Lake Trail (203 feet); Nancy Lake – Susitna Trail (260 feet); Iron Dog Trail (218 feet); Crooked Lake Trail 212 feet; Iditarod Link Trail (206 feet); Wildlife Refuges: Susitna Flats State Game Refuge (6.5 acres)						
Mac East – Connector 3 – Willow		6	93	7	1,305	1,276
<b>Parks &amp; Recreation Areas:</b> Little Susitna State Recreation River (69 acres); Crooked Lake Trail (204 feet)						
Mac East – Connector 3 – Houston–Houston North		1	69	0	204	769

**Table M-2**  
**Comparison of Potential 4(f) Impacts by Alternative (page 3 of 3)**

<b>Alternative</b>	<b>Section 4(f) Resources and Areas Potentially Impacted<sup>a</sup></b>	<b>Number of Known 4(f) Recreational Trails Crossed<sup>b</sup></b>	<b>Total Potentially Impacted ROW Acreage - Recreation Areas<sup>c</sup></b>	<b>Total Potentially Impacted ROW Acreage - Wildlife Refuge<sup>c</sup></b>	<b>Total Potentially Impacted Recreational Trail Length (feet)<sup>d</sup></b>	<b>Estimated Potential Noise Impact to Section 4(f) Properties (Acres)</b>
Mac East – Connector 3 – Houston–Houston South	<b>Parks &amp; Recreation Areas:</b> Crooked Lake Trail (204 feet)	1	0	0	204	0
Mac East – Big Lake	<b>Parks &amp; Recreation Areas:</b> Knik Connector Trail (262 feet); 16 Mile Trail (206 feet); Aurora Dog Musers Club Trails (663 feet); Herning Trail (1,277 feet)	4	0	0	2,408	0

a At this time, no cultural resources that would be affected and would qualify for protection under Section 4(f) have been identified. Such resources identified in the future would be addressed as stipulated in the Programmatic Agreement.

b Some segments cross a trail or trail system multiple times. Multiple crossings of a trail by an alternative are counted only once in this table.

c Acreage in these columns denote the direct impacts to the Recreation Areas and Wildlife Refuge resulting from the railline and ROW.

d Trails are also associated with an easement width (generally ranging from 50 to 400 feet for the trails discussed here), so the affected area of a trail would include the acreage of the easement to either side of the trail centerline, in addition to the trail length.

## **M.1.f Measures to Minimize Harm**

SEA has identified preliminary measures and the Applicant has volunteered certain measures to minimize harm to Section 4(f) resources (see Chapter 19, Mitigation). As described in M.1 above, transportation project use of a park, recreation area, or wildlife and waterfowl refuge that qualifies for Section 4(f) protection may be determined to be *de minimis* though the incorporation of mitigation measures. However, the applicant's voluntary mitigation and SEA's preliminary mitigation measures can not lead to a *de minimis* impact determination without written concurrence of officials with jurisdiction over the Section 4(f) properties.

Sections M.1.f.1 through M.1.f.3 describe measures to minimize impacts to Section 4(f) resources. While implementation of these measures would result in a decrease in potential impacts on the Section 4(f) properties, certain properties would experience impacts that would not be *de minimis* based on consultation with the owning agency.

### **M.1.f.1 Mitigation and Measures to Minimize Harm Common to All Parks, Recreation Areas, and Trails**

During final design of the project, the Applicant shall conduct all siting, design, and development of the rail line and associated facilities according to the reasonable requirements within the jurisdiction of the Alaska Department of Natural Resources and the Alaska Department of Fish and Game. (SEA Preliminary Mitigation Measure 17)

To minimize fugitive dust emissions created during project-related construction activities, the Applicant shall implement appropriate fugitive dust suppression controls, such as spraying water or other established measures. The Applicant shall also operate water trucks on haul roads as necessary to reduce dust. (Voluntary Mitigation Measure 22)

In coordination with the U.S. Coast Guard, the Applicant shall provide adequate clearances for navigation of recreational boats on navigable rivers. (Voluntary Mitigation Measure 34)

In coordination with the Alaska Department of Natural Resources (ADNR), the Applicant shall ensure that project-related bridges and culverts placed on navigable or public waters, as determined by the ADNR, are designed and installed to accommodate:

- Navigation by recreational boat users in a manner that shall not impede existing uses, to the extent practicable, and
- Public access and use of the statutory easements as established by the reasonable requirements of Alaska Statute 38.05.127, Access to Navigable or Public Water. (SEA Preliminary Mitigation Measure 38)

Prior to project-related construction, the Applicant shall consult with Alaska Department of Natural Resources (ADNR) and other appropriate agencies and user groups to develop a plan to ensure construction activities occur during the most appropriate timeframe to limit potential impacts on recreation activities. The Applicant also shall comply with the following measures:

- The plan shall be developed prior to completion of final engineering plans and following consultation with the ADNR, the Alaska Department of Fish and Game, other appropriate government agencies, and user groups to determine the location of all officially recognized trails that would be crossed by the rail line.
- The plan shall designate temporary access points if main access routes must be obstructed during project-related construction and include an agreed-upon number and location of access points as determined during consultation with applicable agencies. (SEA Preliminary Mitigation Measure 39)

The Applicant shall consult with the appropriate management agencies, including the Alaska Department of Natural Resources and the Alaska Department of Fish and Game to ensure that project-related bridges and culverts are designed, constructed, and maintained to accommodate travel by winter modes of transportation (snow machine, dog sled, etc.) on streams and rivers used for recreational access, as determined under SEA Preliminary Mitigation Measure 38. (SEA Preliminary Mitigation Measure 40)

### **Willow Creek State Recreation Area, Nancy Lake State Recreation Area, and Little Susitna State Recreation River**

If the Surface Transportation Board authorizes the Willow Segment, the Applicant shall consult with the Alaska Department of Fish and Game and the Alaska Department of Natural Resources to develop and implement measures, including consideration of replacing acreage used for rail right-of-way, to minimize impacts to the Nancy Lake State Recreation Area, Little Susitna State Recreation River, and Willow Creek State Recreation Area to the extent practicable. (SEA Preliminary Mitigation Measure 48)

If the Surface Transportation Board authorizes the Houston North Segment, the Applicant shall consult with the Alaska Department of Natural Resources (ADNR) to develop and implement measures to minimize impacts to the Little Susitna State Recreation River and the Nancy Lake Creek Junction public use site. The Applicant shall replace any camping or other facilities within the right-of-way, as determined through consultation with ADNR. (SEA Preliminary Mitigation Measure 49)

### **Point MacKenzie Trailhead Parking Area and Figure 8 Lake Loop Trail**

If the Surface Transportation Board authorizes the Mac West Segment, the Applicant shall consult with Alaska Department of Natural Resources and Matanuska-Susitna Borough to determine an appropriate location of and relocate the Point MacKenzie Trailhead, Parking Lot, and the eastern end of the Figure 8 Lake Loop Trail to another site. (SEA Preliminary Mitigation Measure 47)

### **Officially Recognized Trails**

The Applicant shall consult with resource management agencies including the Alaska Department of Natural Resources, the Alaska Department of Fish and Game, and appropriate trail user groups regarding provision, access, and design of crossings for trail easements that intersect with the rail line. Consultation shall include concerns related to general dispersed-use

access, informal public trails on state land, blazed section lines, and long stretches of rail line without designated public crossings. (SEA Preliminary Mitigation Measure 41)

### **M.1.f.2 Mitigation for Wildlife Refuges**

#### **Susitna Flats State Game Refuge**

If the Surface Transportation Board authorizes the Mac West Segment, the Applicant shall consult with the Alaska Department of Fish and Game to develop and implement measures, including consideration of replacing refuge acreage used for rail right-of-way, to minimize impacts to the Susitna Flats Game Reserve to the extent practicable. (SEA Preliminary Mitigation Measure 46)

### **M.1.f.3 Mitigation for Cultural Resources**

The Applicant shall develop protocols to inform and prepare project-related construction supervisors of the importance of protecting archaeological resources, graves, and other cultural resources and how to recognize and treat the resources. (Voluntary Mitigation Measure 20)

The Applicant shall comply with the Programmatic Agreement developed through the Section 106 process under the National Historic Preservation Act (Voluntary Mitigation Measure 21).

## **M.1.g Coordination**

### **M.1.g.1 Parks and Recreation Areas**

The location and status of recreational features was determined through a review of scoping comments from public agencies and land managers, analysis of land management plans and other publicly-available resources regarding public parks and recreation areas in the study area, and data requests to ADNR, MSB, Alaska Department of Transportation & Public Facilities (ADOT&PF), and BLM. During the scoping process, ADNR and ADF&G submitted comments that highlighted specific consideration of resource areas for analysis, that identified routing and design considerations, and that indicated their preferred rail line route. These agencies also provided information regarding many of the Section 4(f) resources identified in this evaluation, including the Susitna Flats State Game Refuge, the Nancy Lake State Recreation Area, the Little Susitna State Recreation River, and the Willow Creek State Recreation Area. ADF&G submitted comments during scoping of a similar nature. SEA has also coordinated with MSB, ADNR and Alaska State Mental Health Trust Authority. Discussions included characterization of recreational access and available activities and possible impacts that could result from the selection of various alternatives. Section 4(f) applicability, impact avoidance, and possible mitigation were also subjects of discussion.

Prior to publishing the Draft EIS, SEA presented a preliminary determination of Section 4(f) resources and requested that affected agencies provide their formal response to the significance of the resources. On December 31, 2009 ADNR responded in writing and on February 1, 2010 MSB responded in writing to SEA's preliminary determination of Section 4(f) resources. The Section 4(f) resources identified in their responses as well as their determination of impacts to those resources have been included in this Section 4(f) Evaluation.



### **M.1.g.2 Wildlife Refuges**

SEA met with ADFG to discuss recreational and Section 4(f) impacts in October 2008, with subsequent communications regarding Susitna Flats State Game Refuge, recreational uses, and trail access.

Prior to publishing the Draft EIS, SEA presented a preliminary determination of Section 4(f) resources and requested that the affected agencies provide their formal response to the significance of the resources. ADNR indicated in their letter dated December 31, 2009, that the impacts to the Susitna Flats State Game Reserve would not be *de minimis* and could not be made *de minimis* through mitigation measures.

### **M.1.g.3 Cultural Resources**

Following consultation with the Alaska SHPO, a cultural resources field survey was performed by SEA. This survey was limited to areas within the proposed 200-foot ROW (i.e., the area where direct effects to cultural resources would most likely occur) and where land entry was available (i.e., excluding private and Native land) to identify cultural historical resources and characterize the affected environment. By agreement with the SHPO, SEA focused on identification, and did not conduct systematic excavation to determine the extent of potential sites identified. Therefore, systematic survey and testing was shifted to a later phase of the project (i.e., pre-construction surveys).

As part of the Section 106 process, the STB will continue with the consultation process with appropriate regulatory agencies, tribal entities, affected private parties, and other interested parties. Future consultation is anticipated to result in finalization of the Programmatic Agreement (see Appendix J of this Draft EIS for a Draft Agreement). The Draft Agreement stipulates specific cultural resource considerations for administration, definitions of terms, tribal consultation, identification and evaluation of historic properties and assessment of adverse effects, treatment of historic properties and human remains, monitoring, curation, annual review and reports, training for ARRC employees, procedures for inadvertent discoveries, consultation, dispute resolution, amendment or termination of the Agreement, failure to carry out the Agreement, duration, and execution and implementation.

Execution and implementation of the Final Agreement would evidence that the STB has satisfied its responsibilities under Section 106 of the NHPA pursuant to 36 CFR 800, and that the state has satisfied responsibilities under the Alaska Historic Preservation Act pursuant to Alaska Statute 41.35. Coordination with the involved parties will be ongoing to determine the proper handling of identified Section 4(f) resources.

### **M.1.h Section 4(f) Conclusion**

All potential alternatives of the Port MacKenzie Rail Extension would cross resources protected by Section 4(f) of the Department of Transportation Act as identified in M.1.c above. All of the proposed rail line segments evaluated in the Draft EIS and discussed in this Draft Section 4(f) Evaluation are technically feasible to build and any combination of the segments that would connect the existing main line to Port MacKenzie would satisfy the project's purpose and need.

However, there are only two combinations of segments that would result in *de minimis* impacts on Section 4(f) resources: the Mac East-Big Lake Alternative and the Mac East-Connector 3-Houston-Houston South Alternative. Of these two alternatives, the Mac East-Connector 3-Houston-Houston South Alternative would affect the fewest number (1) and length (204 feet) of Section 4(f) trails, while the Mac East-Big Lake Alternative would affect the greatest number (4) and length (2,408 feet) of Section 4(f) trails. Neither would affect the Susitna Flats State Game Refuge, the Little Susitna State Recreation River, the Nancy Lakes State Recreation Area, or the Willow Creek State Recreation Area.

Of the remaining alternatives that would have adverse impacts on Section 4(f) resources, the Mac West-Connector 1-Willow Alternative would potentially affect the greatest number of recreational trails (9), the longest length of recreational trails (3,395 feet), and the ROW from this alternative would affect the greatest acreage of parks and recreation areas and the wildlife refuge (217 acres). The operation of trains along this alternative would result in severe noise impacts, as defined by the FRA, to 2,765 acres of Section 4(f) properties. Of these remaining alternatives, the Mac East-Connector 3-Houston-Houston North would have the lowest impacts on number of trails (1), acreage of parks and recreational areas and the wildlife refuge affected by the ROW (69 acres), and length of trail crossed (204 feet).

Preliminary and voluntary measures for minimizing impacts to Section 4(f) resources include timing construction to minimize impacts on recreation, designing water crossings to accommodate recreational navigation and access to waterbodies, ensuring adequate trail crossings, minimizing impacts to recreation areas and refuges, relocation of the Port MacKenzie Trailhead and Parking Lot, and incorporating practices for management of fugitive dust during construction activities. Implementation of the recommended preliminary measures to minimize harm and consultations with the managing agencies for eligible Section 4(f) resources described in Section M.1.f would reduce overall impacts to certain Section 4(f) resources and properties including officially recognized trails and the Nancy Lake State Recreation Area to a level that is considered *de minimis*. The construction and operation of the proposed rail line could result in adverse impacts to the Willow Creek State Recreation Area and the Little Susitna State Recreation River depending on the alternative authorized, if any.

Because the effects on all potentially historic properties cannot be fully determined prior to construction phase of the proposed rail line, SEA has developed a draft Programmatic Agreement (PA) for the Port MacKenzie Rail Extension that will govern the completion of the Section 106 process. Significant cultural resources eligible for protection under Section 4(f) that could be encountered during construction would be addressed by the Programmatic Agreement for the Port MacKenzie Rail Extension, which provides for the completion of the Level 2 (Evaluation Phase) survey if the Board authorizes an alternative and the locations of associated facilities have been established (i.e., gathering sufficient data for a determination of eligibility to the National Register). Additionally, the Programmatic Agreement establishes responsibilities for the treatment of historic properties, the implementation of mitigation measures, and ongoing consultation efforts, thereby ensuring that harm would be minimized to historic properties.

## **M.2 Section 6(f) Evaluation**

### **M.2.a Introduction**

Section 6(f) of the Land and Water Conservation Fund Act (LWCF) (16 U.S.C. 460l-4 et seq) stipulates that:

No property acquired or developed with assistance under [the Land and Water Conservation Fund Act], without the approval of the Secretary [Interior], be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as he deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location (16 U.S.C. 460l-4 et seq).

The statute is applicable to a property as a whole that has received funding from LWCF, regardless of where the resources were spent within an area.

### **M.2.b Section 6(f) Requirements**

Section 6(f) of the LWCF is intended to protect parks and other recreational resources from conversion to other uses. The Section 6(f) parkland conversion process applies only to those state, county, or local recreational resources which have received funding through LWCF. The ADNR Division of Parks and Outdoor Recreation serves as a liaison with the National Park Service (NPS) for purposes of administering the LWCF program, including distribution of funds and monitoring the state's compliance with LWCF requirements. The NPS makes the ultimate decision on whether to approve a conversion of land that has received LWCF funds.

The NPS will consider conversion of public outdoor recreation areas to another use, if the following prerequisites have been met:

- All practicable alternatives to the conversion have been evaluated and rejected on a sound basis;
- The property proposed for substitution is of at least fair market value as that of the property to be converted; and
- The property proposed for replacement is of reasonably equivalent usefulness and location for recreational purposes as that being converted.

The replacement property need not provide identical recreational activities or resources, but it must meet public outdoor recreation needs as indicated in the Statewide Comprehensive Outdoor Recreation Plan.

## **M.2.c Section 6(f) Resources Potentially Affected by the Proposed Project**

The Nancy Lake State Recreation Area is the only potentially affected property that has received funding from the LWCF. It would be crossed by the Willow Segment, and would therefore be potentially affected by the Mac West-Connector 1-Willow and Mac East-Connector 3-Willow alternatives. The potentially impacted acreage would be 12 acres that would be directly impacted on the western side of the park (directly west of Red Shirt Lake) along with 20 acres that could be separated from the Recreation Area and indirectly impacted west of the rail line ROW. Figure M-4 illustrates the crossing area.

The Nancy Lake State Recreation Area is a popular and easily-accessible recreation area characterized by interconnected lakes and rolling landscapes. Some of the recreation activities available include canoeing, picnicking, fishing, hiking, camping, dog sledding, skiing, snowshoeing, and snowmachining. The Little Susitna State Recreation River passes through the southeast portion of Nancy Lake State Recreation Area and canoers can portage to Nancy Lake to utilize the ample water trail system within the park. Nancy Lake currently receives approximately 40,000 visitors per year, with the highest use in the summer (ADNR 2007).

## **M.2.d Description of Alternatives**

In addition to the two alternatives that would potentially affect Nancy Lake State Recreation Area, this Draft EIS evaluates six other rail alternatives and a No-Action Alternative. They include:

- Mac West-Connector 1-Houston-Houston North
- Mac West-Connector 1-Houston-Houston South
- Mac East-Connector 3-Houston-Houston North
- Mac East-Connector 3-Houston-Houston South
- Mac West-Connector 2-Big Lake
- Mac East-Big Lake
- No Action

None of these alternatives including the No-Action Alternative would affect Section 6(f) properties.

## **M.2.e NPS/ADNR Determination**

Conversations were held with ADNR DPOR on December 18, 2008 to determine which areas have received LWCF funding and would require a potential conversion of land. ADNR confirmed that the Nancy Lake State Recreation Area was the sole recipient of LWCF funds in the project area. This was verified with the NPS database of LWCF recipient properties for the MSB (NPS 2008).

ADNR indicated that, were ARRC to decide that one of the two alternatives affecting Nancy Lake State Recreation Area would be considered its preferred project alternative, the DPOR would need to be formally contacted. DPOR would first approve a conversion plan, relate the

conversion concept to NPS, and NPS would have to agree to the conversion before proceeding. SEA's preliminary mitigation measures regarding conversion would require that the railroad provide land of equal or greater value in substitution for all converted land as identified in consultation and agreement with DPOR. For 6(f) land conversions, DPOR typically informs the project proponent of the land it would like to acquire. Replacement land need not be on-site but would have to be in a use other than public recreation. Following approval of a conversion concept, NPS requires that a series of formal appraisals be conducted both for the land to be taken for the project, and of the replacement land (Gray pers. comm., 2008, 2009).

## **M.2.f Section 6(f) Conclusion**

A portion of Nancy Lake State Recreation Area, which has received funding from LWCF, would be permanently converted from recreational to non-recreational uses in the event that either the Mac West-Connector 1-Willow Alternative or the Mac East-Connector 3-Willow Alternative is authorized by the Board. No properties protected by LWCF Section 6(f) would be affected by any other alternative.

## **M.3 References**

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**APPENDIX N**  
**HAZARDOUS MATERIAL SITES AND**  
**REGULATED FACILITIES – FEDERAL AND**  
**STATE DATABASES AND RECORDS**



## N. HAZARDOUS MATERIAL SITES AND REGULATED FACILITIES – FEDERAL AND STATE DATABASES AND RECORDS

This appendix identifies the Federal and State of Alaska databases searched to identify known sites contaminated with hazardous materials within 0.5 mile of the Port MacKenzie Rail Extension segments (Table N-1).

**Table N-1**  
**Databases and Records Reviewed (page 1 of 3)**

<b>Database/Records</b>	<b>Agency/ Program</b>	<b>Source and/or Release Date</b>	<b>Description</b>
<b>Federal Records</b>			
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	USEPA/Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund	<a href="http://www.epa.gov/enviro/html/cerclis/cerclis_query.html">http://www.epa.gov/enviro/html/cerclis/cerclis_query.html</a> (12/16/08)	USEPA computerized inventory of potential hazardous substance release sites.
National Priority List (NPL)	USEPA/Superfund	<a href="http://www.EPA.gov/superfund/sites/npl/ak.htm">http://www.EPA.gov/superfund/sites/npl/ak.htm</a> (12/16/08)	Subset of CERCLIS of 1,200 sites identified for priority cleanup under the Superfund program.
NPL Records of Decision (RODs) system search page	USEPA/Superfund	<a href="http://cfpub.epa.gov/superrods/index.cfm?fuseaction=main.search">http://cfpub.epa.gov/superrods/index.cfm?fuseaction=main.search</a> (5/05/09)	Lists sites with RODs (mandated permanent cleanup remedies containing technical & health information to aid in cleanup).
Alaska Cleanup Sites	USEPA/Superfund	<a href="http://yosemite.epa.gov/r10/cleanup.nsf/webpage/Alaska+Cleanup+Sites">http://yosemite.epa.gov/r10/cleanup.nsf/webpage/Alaska+Cleanup+Sites</a> (5/6/09)	Lists Alaska Brownfields, Oil, RCRA Corrective Action Superfund sites.
Proposed NPL sites	USEPA/Superfund	<a href="http://www.epa.gov/superfund/sites/query/queryhtm/nplprop1.htm">http://www.epa.gov/superfund/sites/query/queryhtm/nplprop1.htm</a> (5/05/09)	Lists a subset of CERCLIS sites undergoing evaluation to determine if they should be listed for priority cleanup under Superfund.
Deleted NPL sites	USEPA/Superfund	<a href="http://www.EPA.gov/superfund/sites/npl/ak.htm">http://www.EPA.gov/superfund/sites/npl/ak.htm</a> (12/16/08)	Lists sites deleted from the NPL due to cleanup or USEPA finding of no harm to environment or human health exists.
Resource Conservation and Recovery Act (RCRA) Info database.	USEPA/RCRA	<a href="http://www.EPA.gov/enviro/html/em/index.html">http://www.EPA.gov/enviro/html/em/index.html</a> and <a href="http://yosemite.epa.gov/R10/OWCM.NSF/ed6c817875102d2d8825650f00714a59/d26539284e2898aa88256e710072c3ff/\$FILE/ak_regulated_handler_list_alpha_sort.pdf">http://yosemite.epa.gov/R10/OWCM.NSF/ed6c817875102d2d8825650f00714a59/d26539284e2898aa88256e710072c3ff/\$FILE/ak_regulated_handler_list_alpha_sort.pdf</a> (5/05/09)	Information on sites generating, storing, transporting, treating and/or disposing of RCRA-defined hazardous waste.

**Table N-1**  
**Databases and Records Reviewed (page 2 of 3)**

Database/Records	Agency/ Program	Source and/or Release Date	Description
<b>Federal Records (cont'd)</b>			
Open Dump Inventory	USEPA/RCRA	<a href="http://www.osti.gov/energy/citations/product.biblio.jsp?osti_id=6269222">http://www.osti.gov/energy/citations/product.biblio.jsp?osti_id=6269222</a>  (1/21/08 – requires subscription for access)	Lists open dumps on Federal lands.
Emergency Response Notification System	USEPA/National Reporting Center	<a href="http://www.epa.gov/Region4/r4data/erns/">http://www.epa.gov/Region4/r4data/erns/</a>  (5/05/09)	Stores information from all Federal agencies on releases of oil and hazardous substances in a standardized format.
DoD Sites/U.S. Army, U.S. Air Force, U.S. Navy and Defense Energy Support Center	USEPA	<a href="http://www.dec.state.ak.us/spar/csp/DoD_sites.htm">http://www.dec.state.ak.us/spar/csp/DoD_sites.htm</a>  (1/21/08)	Lists active DoD sites with known contamination by the primary Federal agency responsible for oversight.
Formerly Used Defense Sites (FUDS)	DoD/U.S. Army Corps of Engineers	<a href="http://www.dec.state.ak.us/spar/csp/DoD_sites.htm#fuds">http://www.dec.state.ak.us/spar/csp/DoD_sites.htm#fuds</a>  (1/09/08)	Lists properties formerly operated by DoD containing hazardous, toxic, or radioactive wastes in soil or groundwater.
US Brownfields	USEPA/Brownfields	<a href="http://www.brownfieldstsc.org/site_support_searchresults.cfm?show=detail">http://www.brownfieldstsc.org/site_support_searchresults.cfm?show=detail</a> (1/21/08)	Lists properties where redevelopment or reuse may be complicated by the presence or potential presence of a contamination.
U.S. Department of Energy (DOE) Legacy Management (LM) Program	DOE Office of Environmental Management (EM)	<a href="http://www.em.doe.gov/StatePages/AK.aspx?PAGEID=MAIN">http://www.em.doe.gov/StatePages/AK.aspx?PAGEID=MAIN</a>  (1/21/08)	List “active” sites associated with the legacy of the nation’s nuclear weapons program and other DOE research and development activities.  The “active” sites continue to have ongoing cleanup projects under EM’s purview.
DOE LM	DOE Office of Legacy Management	<a href="http://www.lm.doe.gov/land/sites/sites_map.htm">http://www.lm.doe.gov/land/sites/sites_map.htm</a>  (1/9/08)	Lists sites associated with the legacy of the nation’s nuclear weapons program or other DOE research and development activities.
Toxic Release Inventory System	USEPA/Toxic Substances Control Act	<a href="http://www.EPA.gov/tri/">http://www.EPA.gov/tri/</a>  (8/31/07)	Provides annual information on toxic chemical releases & other waste management activities by certain industry groups & Federal facilities.
<b>State Records</b>			
ADEC/Division of Spill Prevention and Response Contaminated Sites Program (CSP) DoD contaminated sites database	ADEC/CSP	<a href="http://www.dec.state.ak.us/spar/csp/DoD_sites.htm">http://www.dec.state.ak.us/spar/csp/DoD_sites.htm</a> and <a href="http://www.dec.state.ak.us/spar/csp/list.htm">http://www.dec.state.ak.us/spar/csp/list.htm</a>  (12/16/08)	Interactive website tracks, lists and describes DoD facilities containing contaminated sites. This includes sites listed as Formally Used Defense Sites (FUDS) plus active US Air Force and U.S. Army sites.

**Table N-1**  
**Databases and Records Reviewed (page 3 of 3)**

<b>Database/Records</b>	<b>Agency/ Program</b>	<b>Source and/or Release Date</b>	<b>Description</b>
<b>State Records</b>			
ADEC CSP Contaminated Sites and Leaking Underground Storage Tanks (LUST) database	ADEC/CSP	<a href="http://www.dec.state.ak.us/spar/csp/search/default.asp">http://www.dec.state.ak.us/spar/csp/search/default.asp</a> (12/16/08)	Interactive website tracks, lists and describes all reported contaminated sites and LUSTs.
ADEC CSP Voluntary Cleanup Program (VCP) and Institutional or Engineering Controls (ICE) database	ADEC/CSP	<a href="http://www.dec.state.ak.us/spar/csp/search/default.asp">http://www.dec.state.ak.us/spar/csp/search/default.asp</a> (12/16/08)	Interactive website tracks, lists and describes all contaminated in the VCP and/or containing ICE.
ADEC CSP Regulated Underground Storage Tank (UST) database and Aboveground Storage Tank (AST) regulation summaries.	ADEC Industry Preparedness Program	<a href="http://www.dec.state.ak.us/spar/ipp/ust/search/default.htm">http://www.dec.state.ak.us/spar/ipp/ust/search/default.htm</a> (12/16/08) <a href="http://www.dec.state.ak.us/spar/ipp/ast_reg.htm">http://www.dec.state.ak.us/spar/ipp/ast_reg.htm</a> (5/05/09)	Interactive website tracks, lists and describes all active, inactive and closed USTs. Website lists regulation summaries for ASTs with different capacities.
Solid Waste Landfills	ADEC Division of Health, Solid Waste Program	<a href="http://www.dec.state.ak.us/eh/sw/swpermits.htm">http://www.dec.state.ak.us/eh/sw/swpermits.htm</a> (5/4/09)	Interactive website tracks, lists and describes all active and closed regulated landfills by region and disposal permit. Also list known unregulated landfills.

## **APPENDIX O**

### **CUMULATIVE IMPACTS**

## **O. CUMULATIVE IMPACTS**

The Surface Transportation Board's (STB or the Board) Section of Environmental Analysis (SEA) researched and collected information about other future projects and actions that could result in impacts that would coincide in time and space with potential impacts of the proposed Port MacKenzie Rail Extension. SEA interviewed key personnel from project proponent and/or permitting offices and agencies to identify various past, present, and reasonably foreseeable future projects and actions, and reviewed analyses and information about those projects and actions to identify which to include in the cumulative impacts analysis and/or as part of each resource area analysis. SEA then applied a screening process to determine if projects were reasonable, foreseeable, and could be associated with potential cumulative impacts. This appendix describes projects and actions SEA considered for inclusion in the cumulative impacts analysis. Section O.1 describes projects and actions SEA included in the analysis; Section O.2 lists projects SEA did not include in the analysis and provides an explanation for their exclusion; and, lastly, Section O.3 describes potential cumulative impacts of the proposed rail line when added to the impacts of projects and actions described in Section O.1.

### **O.1 Projects and Actions Included in the Analysis**

#### **O.1.1 Beluga to Fairbanks Natural Gas Pipeline**

The Alaska Natural Gas Development Authority (ANGDA) has proposed a 20- to 24-inch high-pressure, bi-directional, buried steel natural gas pipeline project between Beluga and Fairbanks (B2F) to bring Cook Inlet natural gas to North Pole/Fairbanks, Alaska. The B2F pipeline would consist of a total of four segments (ANGDA, 2008); however, this cumulative impacts analysis includes only the Beluga Fields to Palmer segment of the pipeline. This segment would follow one of two routes, both of which are located in the southern half of the Port MacKenzie Rail Extension project area. The Enstar Route option would cross the Connector 1, Connector 3, and Big Lake segments, while the Chugach Route option would cross the Mac East and Mac West segments. Approximately 90 percent of the proposed 480 miles of pipeline would be in existing right-of-ways (ROWs) and easements. In the longer term, ANGDA expects to build feeder lines and take-off points as the system grows to meet Alaska's needs.

#### **O.1.2 Cook Inlet Areawide Oil and Gas Lease Sale**

The Alaska Department of Natural Resources (ADNR) made a final best interest finding for the Cook Inlet areawide oil and gas lease sale (applicable to sales from 2009 through 2018) and released a notice of sale on April 3, 2009. The ADNR sold four tracts (totaling 7,685 acres) at the May 20, 2009 sale. Three of the tracts and most of the total acreage leased are offshore (ADNR, 2009). Additional authorizations are required for subsequent exploration, development, and production phases. Though impacts from the May 2009 sale would be focused in the Cook Inlet, most of the Port MacKenzie Rail Extension project area could be included in future lease sales.

### **O.1.3 Cook Inlet Ferry**

Matanuska-Susitna Borough (MSB) is proposing a year-round commuter ferry system that would provide transportation across the 2 miles of Knik Arm that separates the MSB and Anchorage, Alaska. This project would involve the construction of a ferry landing located more than 1 mile from the Mac West Terminal Reserve of the Port MacKenzie Rail Extension. The terminal building and parking area for the ferry have already been constructed. The MSB plans to submit an application for dock construction after it finds a design agreeable to the U.S. Coast Guard, Cook Inlet Tug and Barge, and the Municipality of Anchorage. Pending funding, the MSB anticipates constructing a dock at Port MacKenzie in summer 2010 (ADN, 2009) and the ferry would go into service the following year (Maritime News, 2009).

### **O.1.4 Cook Inlet OCGen™ Power Project**

Ocean Renewable Power Company Alaska has developed a proprietary ocean current electrical generation technology (OCGen™) to generate renewable electricity from open-ocean and tidal currents with minimal impact to the environment (ORPC, 2006). The OCGen™ Tidal Turbine-Generator Unit (TGU) utilizes advanced design cross flow turbines on either side of a single underwater permanent magnet generator and has no gears. TGUs can be stacked to create larger OCGen™ modules. Ocean Renewable Power Company plans to install the prototype OCGen™ module in the Cook Inlet in mid-2010, operate it until at least mid-2011, and begin installation of the first phase of the ultimate tidal energy project in mid-2012 (ORPC, 2009). Project impacts would be focused on the specified installation location within the Cook Inlet, and to-be-determined onshore locations where transmission lines would be constructed. As of September 2009, the technology had been developed to the point of field testing; feasibility tests and other studies were in progress. On June 29, 2009, the Federal Energy Regulatory Commission (FERC) requested additional information from Ocean Renewable Power Company to be submitted by January 31, 2010, so FERC could conclude the pre-filing process (FERC, 2009). Ocean Renewable Power Company submitted additional information to FERC in January 2010 and FERC accepted that information for filing (FERC, 2010).

### **O.1.5 Knik Arm Crossing**

The Knik Arm Crossing project would involve constructing 2.5-mile-long bridge crossing the Knik Arm of Upper Cook Inlet in order to connect the Municipality of Anchorage with the MSB. The project would include a toll plaza, a rural principle artery, and phased construction to meet anticipated future travel demand (KABATA and ADOT&PF, 2007). The roadway connection on the MSB side of Knik Arm would be Point MacKenzie Road near the Port MacKenzie District. The crossing landfall would be located approximately 1 mile from the Mac West Terminal Reserve and approximately 3 miles from the Mac East Terminal Reserve. Impacts resulting from the crossing would be focused at the southern end of the Port MacKenzie Rail Extension project area. On September 18, 2007, the Federal Highway Administration issued the *Final Environmental Impact Statement and Final Section 4(f) Evaluation Summary for the Knik Arm Crossing*. A Record of Decision is pending consultation with the National Marine Fisheries Service on the beluga whale (KABATA, 2009).

### **O.1.6 Knik-Willow Transmission Line Upgrade**

The Alaska Energy Authority (AEA) Knik-Willow (Teeland-Douglas) transmission line upgrade project would replace an older segment of the Anchorage-Fairbanks Intertie with 25 miles of new 230 kilovolt transmission line between the Teeland (Knik) and Willow (Douglas) substations in Alaska. The transmission line route would be located in the northern part of the Port MacKenzie Rail Extension project area and would likely cross the Houston North, Houston South, and Big Lake segments. As of February 2009, AEA anticipated that an additional route from the Lake Lorraine area near Point MacKenzie to Willow would be studied and possibly could include a new switchyard about 3 miles northwest of Port MacKenzie. The AEA published a Draft Alaska Railbelt Regional Integrated Resource Plan (RIRP) Study in December 2009. That Draft RIRP includes a Lake Lorraine to Douglas route for a possible new transmission line. SEA did not include that possible Lake Lorraine to Douglas route area in this analysis because there are no specific routes or alternative routes defined. The Draft RIRP indicates that detailed engineering and permitting activity plans are not finalized or funded, and, if finalized and funded, would begin in the 2011 through 2016 timeframe (Black & Veatch, 2009).

### **O.1.7 Goose Creek Correctional Center**

The Goose Creek Correctional Center, a joint project between the MSB and the State of Alaska, is an approximately 450,000 square foot, 1,536 bed medium-security prison at the corner of Alsop Road and Point MacKenzie Road. The facility will be on a 300-acre lot, 150 acres of which have already been cleared as of June 2009 (ADOC and MSB, 2009a). As part of this and other projects, Point MacKenzie Road and Alsop Road would be upgraded to meet applicable standards. As of September 2009, it was anticipated that the facility will be commissioned in late 2011 or early 2012 and will begin operations in early to mid-2012. Impacts from the correctional center would be focused in the area of the Mac East Segment of the Port MacKenzie Rail Extension.

### **O.1.8 MSB Regional Aviation System Plan**

The MSB Regional Aviation System Plan (RASP) includes a basic inventory of airports and improvements needed at public airports; a forecast of aviation growth; locations for new public airports and/or floatplane bases; and preliminary plans for layout of the highest priority new airports and floatplane bases. New or upgraded airport facilities identified in the RASP include locations at Big Lake, Goose Bay, and Seven-Mile Lake. The closest Port MacKenzie Rail Extension segment would be the Big Lake Segment. Additionally, as a corollary to the RASP, the MSB Assembly approved a Float Plane Facility Location study, but a future reconnaissance and environmental study will be needed to identify the preferred location of this facility (Sworts, 2008).

### **O.1.9 Port MacKenzie Development Projects**

The MSB owns Port MacKenzie and continues to explore commercial ventures for the port, as highlighted by the projects listed below. Impacts from the projects below would be focused at the southern end of the Port MacKenzie Rail Extension project area and would be located closest

to the Mac East and Mac West Terminal Reserves. In addition to the projects listed here, the MSB is considering other projects not included in this cumulative impacts analysis because SEA considers them speculative (see Section O.2) (Zartman, 2008).

#### **O.1.9.1 Bulk Materials Facility**

In a verified statement submitted to the STB on December 16, 2008, the MSB indicated that they are pursuing development of a bi-modal bulk materials facility at Port MacKenzie. The facility plan would include upgrades to roads, storage, and storage areas at the Port (ARRC, 2009a). Construction started on the access road and the stock-pile pad in September 2009 (Sworts, 2009).

#### **O.1.9.2 Gravel Mining**

As part of an ongoing port expansion project, the MSB and Quality Asphalt and Paving are moving gravel by dump scow from an excavation site in Port MacKenzie to the Port of Anchorage to provide the foundation for the marine terminal development north expansion (White, 2008). Approximately 451,000 tons were excavated in the summer of 2008 (Zartman, 2008), no gravel was excavated in the summer of 2009 for the Port of Anchorage project, and approximately 450,000 tons are planned for excavation in the summer of 2010 (Zartman, 2009).

Another mining project at the Alsop pit located approximately 10 miles north of the port involved the mining of less than 100,000 tons of Class A gravel to be used for the Point MacKenzie Road Upgrades and Paving project (Sworts, 2009).

#### **O.1.9.3 Deep-Draft Dock Expansion**

In July 2008, the U.S. Army Corps of Engineers permitted expansion plans for a deep-draft dock at Port MacKenzie. Although the preliminary designs have been completed for this expansion, as of October 2009, Port MacKenzie had not secured funding for the project (Zartman, 2009). In December 2004, the berth depth of the dock proposed for expansion was increased to 60 feet in order to accommodate vessels such as panamax and cape-sized vessels, state ferries, and cruise ships to dock. After the dock was completed, a private company constructed a conveyor system, road, and 18-acre pad to allow for the import and export of commodities.

#### **O.1.9.4 Port MacKenzie-Barge Dock Expansion**

A Port MacKenzie barge dock constructed in 2000 and expanded in 2003 (Port MacKenzie, 2008) is expected to be further expanded by almost 8 acres. The Port received a permit for the expansion in January 2007, funding was received in 2009, and construction is anticipated to begin in winter 2009-2010 (Zartman, 2009).

### **O.1.10 Port of Anchorage Marine Terminal Redevelopment Project**

The Port of Anchorage Marine Terminal Redevelopment Project will expand, reorganize, and improve the Port of Anchorage over a 7-year period by adding 135 acres of land (doubling the size of the marine terminal) and providing approximately 8,880 linear feet of waterfront structures near the existing Port of Anchorage marine terminal. The project is located across the Cook Inlet from the southern end of the Port MacKenzie Rail Extension project area.



Construction began in 2005 and is expected to continue through 2014, primarily in summer field seasons. The U.S. Department of Transportation Maritime Administration, in cooperation with the Port of Anchorage, published an Environmental Assessment and a Finding of No Significant Impact in March 2005 (Port of Anchorage Intermodal Project, 2008).

### **O.1.11 Road Projects**

A number of road projects are planned throughout the Port MacKenzie Rail Extension project area, including areas near the Big Lake, Willow, Mac East, and Mac West segments. SEA included those road projects listed below in the cumulative impacts analysis as reasonably foreseeable because they are funded; their designs are almost complete and would be ready for implementation upon receiving or being assigned funding; or they have been designated as a recipient of American Reinvestment and Recovery Act funding.

#### **O.1.11.1 Parks Highway: Lucas Road (Wasilla) to Big Lake Cutoff Improvements (State Transportation Improvement Program [STIP] #11961)**

This project would widen Parks Highway to four lanes as well as perform traffic and safety improvements between Wasilla and the Big Lake Cutoff (ADOT&PF, 2006). The improvements would include work at Bridge No. 1922 Wasilla Railroad Crossing (ADOT&PF, 2008a). As of July 2009, the Alaska Department of Transportation & Public Facilities (ADOT&PF) was in the environmental assessment phase of the project. Design is scheduled for 2010, clearing the right-of-way is scheduled for 2012, and construction of the roadway is scheduled for 2013 (ADOT&PF, 2009b).

#### **O.1.11.2 Parks Highway: Willow Creek Bridge to Kashwitna River Bridge Rehabilitation, Mile Posts 72 to 83**

This ADOT&PF project involves Federal funding for rehabilitation and necessary safety improvements to Parks Highway. In April 2009, a categorical exclusion was completed for the project, indicating that the project does not generally result in adverse environmental impacts (ADOT&PF, 2003). Construction has begun and is anticipated to be completed in October 2010 (ADOT&PF, 2009b).

#### **O.1.11.3 Point MacKenzie Road Upgrades and Paving (STIP #20254)**

This realignment and paving project upgrades 12.2 miles of Point MacKenzie Road from the intersection of South Burma Road to a point 0.5 mile before the intersection with Lu Young Lane (Koski, 2009), as noted in the 2006-2009 STIP. In addition to widening, this project includes straightening 13 curves in the lower 9 miles of Point MacKenzie Road and installing culverts to cross drainages along the alignment (MSB, 2009a). A geotechnical report was used to develop three alternatives to complete the final 0.5 mile of upgrades (Koski, 2009). Construction on this segment began in June 2009 (MSB, 2009a).

#### **O.1.11.4 Point MacKenzie Road Improvements: Don Young Road Upgrades**

The MSB, in cooperation with the ADOT&PF and the Alaska Division of Federal Highway Administration, is proposing repairs to Point MacKenzie Road between Mile Posts 21.8 and 23.0

– a segment also known as Don Young Road (Jackson, 2009) – to improve vehicle safety and increase access to the Port MacKenzie dock. This project would reduce the grade of Don Young Road from 10 percent to 5 percent and improve water drainage. Seven culverts would be placed under the roadway, and drainage ditches would be constructed. A Categorical Exclusion for this project was completed on May 19, 2008 (ADOT&PF, 2008b). As of September 2009, construction to upgrade Don Young Road had not begun.

#### **O.1.11.5 South Big Lake/Burma Road Upgrades (previously STIP #21355)**

These adjacent projects would upgrade South Big Lake and Burma Roads. In 2008, the ADOT&PF performed environmental and preliminary design work for the Burma Road improvements (ADOT&PF, 2008d). Final design and ROW acquisition funds are earmarked for 2009 (ADOT&PF, 2008c). The designs of both road projects are expected to be completed by mid-2010; however, the ADOT&PF will need additional state appropriations to begin construction.

#### **O.1.11.6 Knik Goose Bay Road Improvements**

Improvements to the Knik Goose Bay Road would include installing traffic signals at Fairview Loop Signal and Vine Road. At present, the project is in the design phase, with construction and installation anticipated for summer 2009 (Kemplen, 2008); however, the ADOT&PF needs an additional \$600,000 in funding for the Fairview Loop Signal options. The ADOT&PF completed Environmental Checklists for both intersection projects in 2008 (ADOT&PF, 2008e).

#### **O.1.12 South Wasilla Rail Line Relocation**

Alaska Railroad Corporation (ARRC) plans to straighten curves along the main line track in South Wasilla, between ARRC Mile Posts 154 and 158. The relocation would take place in the far eastern end of the Port MacKenzie Rail Extension project area and would be closest to the Big Lake Segment. The Federal Transit Administration issued an Environmental Assessment in September 2005 and a Finding of No Significant Impact in January 2006 (FTA, 2006). ARRC will construct the project in two phases. Phase One is approximately from ARRC Mile Posts 154 to 156; Phase Two is from ARRC Mile Posts 156 to 158. As of January 2009, ARRC was working to acquire the ROW for Phase One (ARRC, 2009b).

#### **O.1.13 Su-Knik Wetland Bank – Umbrella Mitigation Bank Instrument – Big Lake South Individual Bank Plan**

The MSB and Sustainable Environments, LLC partnership, together referred to as Su-Knik, propose to establish an umbrella preservation mitigation bank. The Big Lake South Bank, a 2,279-acre wetland preservation mitigation bank, is located in the MSB just southeast of Big Lake and just south of the Houston, Wasilla, and Palmer growth corridor, and would be a part of this umbrella. Fish Creek, Threemile Creek, and Goose Creek flow through the project area and connect an extensive complex of existing wetlands. The Supplement to the Umbrella Bank Instrument<sup>1</sup> for Big Lake South Bank was completed in September 2007 (Interagency Review

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<sup>1</sup> A Mitigation Bank Instrument is a planning document used to establish a wetland mitigation bank.

Team, 2007a and 2007b). The mitigation banks would be located near the area of the Connector 1 Segment, and the Houston Segment, and would cross the Big Lake Segment of the Port MacKenzie Rail Extension.

### **O.1.14 West Mat-Su Access Project**

The MSB has proposed to build a bridge across the Little Susitna River into the southern part of the Fish Creek Management Area, thereby providing road access to the western side of the Little Susitna River. The MSB is studying four road access route options including three locations for the bridge: the extension of Susitna Parkway in the Big Lake area, a location approximately 0.8 mile north of where the Iditarod National Historic Trail crosses the river, and near the existing Little Susitna River access at the end of Ayrshire Road. The access project might also include a short spur road continuing 3 to 4 miles west past the Little Susitna River (MSB, 2007). The Federal Highway Administration would fund the project. Potential road options associated with the access project could intersect Connector 1 and Big Lake segments of the Port MacKenzie Rail Extension.

## **O.2 Projects Considered but not Included in the Analysis**

Certain projects proposed in the vicinity of the Port MacKenzie Rail extension have been excluded from this cumulative impacts analysis for the reasons provided below.

- A proposed Matanuska Electric Association coal-fired power plant is not being considered until at least 2012 (Carter pers. comm., 2008) and is therefore not considered reasonably foreseeable.
- A proposed MSB agricultural processing and product development facility to be co-located with a nutrition center is not funded and is therefore not considered reasonably foreseeable.
- Certain Port MacKenzie development projects have been proposed but have no associated design specifics and/or funding and are therefore not considered reasonably foreseeable.
- U.S. Army Corps of Engineers permitting actions were considered; however, no current or foreseeable USACE permit applications would be in the area of the proposed Port MacKenzie Rail Extension. SEA searched the USACE Alaska District Web site for USACE-sponsored operations and permit applications and contacted officials from the USACE's Regulatory Division to identify future applications that are known, but have not yet been officially filed. Because no projects require permits are planned in the vicinity, USACE actions are not included in this cumulative impacts analysis.
- The MSB completed a draft Joint Land Use Study to provide recommendations regarding land development policies and a compatible implementation strategy that supports the military's mission in the study area (MSB, 2009b). The draft Joint Land Use Study addresses noise concerns and appears to indicate that no noise contour is generated for helicopter operations because of the low number of helicopter operations. Because there are no residences in the very small area of overlap between the Port MacKenzie Rail Extension

project area and the Elmendorf AFB contour, SEA concluded that it did not require further analysis.

## **O.3 Environmental Consequences**

This section discusses the potential cumulative impacts resulting from the proposed Port MacKenzie Rail Extension in conjunction with the other reasonably foreseeable actions described in Section O.1. For this analysis, SEA identified potential cumulative impacts to all of the environmental resource areas described in Chapters 3 through 15 of the Environmental Impact Statement (EIS). Cumulative impacts are discussed according to these resource areas in Sections O.3.1 through O.3.13 below.

### **O.3.1 Geology and Soils**

#### **O.3.1.1 Analysis**

The primary impacts to geology and soils from the proposed Port MacKenzie Rail Extension construction and operations would include:

- Modification of topography through excavation and fill
- Removal and replacement of soils classified as unsuitable for construction of railroad embankments and service roads
- Exposure of highly erodible soils to the erosive forces of wind and water
- Conversion of lands within the ROW that contain soils considered to be of local importance for agriculture
- Potential damage to infrastructure from seismic events

Past impacts to soils and geology in the project area are primarily a result of excavation and fill activities associated with construction of the existing roadway network, residential and agricultural development, and borrow-site development. All of these activities result, to some extent, in minor impacts involving topographic modification and removal and replacement of the existing soil profile. Some these activities also lead to the exposure of highly erodible soils or conversion of agricultural lands.

Present and reasonably foreseeable cumulative impacts to geology and soils resulting from the Port MacKenzie Rail Extension in conjunction with the specific projects described in Section O.1 are listed below.

#### **Cook Inlet Areawide Oil and Gas Lease Sale**

The lease of state-owned land under the Cook Inlet areawide oil and gas lease sale would result in minor impacts to geology and soils resources in the Port MacKenzie Rail Extension project area. Impacts to geology and soils would result primarily from development activities, such as the excavation and fill associated with construction of facilities and access roads and land

clearing to create linear corridors for seismic surveys (ADNR, 2008). Such development activities could expose highly erodible soils, which could result in potential cumulative impacts to geology and soils in conjunction with those impacts associated with the Port MacKenzie Rail Extension alternatives.

### **Cook Inlet Ferry**

The Cook Inlet Ferry project would impact geology and soils in the Port MacKenzie Rail Extension project area through excavation and fill activities associated with construction of the dock and landing. Minor cumulative impacts to geology and soils could result from these construction activities. Terminal buildings and parking areas for the ferry are already constructed and would therefore not contribute to cumulative impacts to geology and soils in conjunction with the Port MacKenzie Rail Extension alternatives.

### **Knik Arm Crossing**

The Knik Arm crossing would impact geology and soils in the Port MacKenzie Rail Extension project area through excavation and fill activities associated with road upgrades and construction of new roadways connecting to the bridge. Development in the Point MacKenzie Agricultural Area would be expected as a result of the Knik Arm Crossing Project, and would contribute to the conversion of land that contain soils the MSB considers to be of local importance for agricultural purposes (FHWA and KABATA, 2007). Construction activities and development in previously undisturbed areas could also increase soil erosion (FHWA and KABATA, 2007). Minor cumulative impacts to geology and soils could result from these construction and development activities.

### **Knik-Willow Transmission Line Upgrade**

The four alternative routes for the 230 kilovolt Teeland-Douglas transmission line upgrade project would require 236 to 242 acres of land clearing (Dryden and LaRue *et al.*, 2004). The land clearing could expose highly erodible soils, and could cumulatively contribute to potential impacts from the Port MacKenzie Rail Extension alternatives that include the Big Lake, Houston North, and Houston South segments. The transmission line facilities would be vulnerable to damage from seismic events.

### **Goose Creek Correctional Center**

The Goose Creek Correctional Center is a new construction project that could contribute minor cumulative impacts to geology and soils in the Port MacKenzie Rail Extension project area through excavation and fill activities associated with construction of the facility and associated access roads and parking lots. Furthermore, the location of the facility in the Point MacKenzie Agricultural Area would result in the conversion of agricultural lands that the MSB considers to be of local importance, thereby cumulatively contributing to potential impacts on soils from the Port MacKenzie Rail Extension.

## **MSB Regional Aviation System Plan**

Implementation of the Regional Aviation System Plan could contribute minor cumulative impacts to geology and soils in the Port MacKenzie Rail Extension project area through excavation and fill activities associated with upgrades to existing airstrips, and construction of new airports and float-plane facilities, and support infrastructure such as access roads and parking lots.

## **Beluga to Fairbanks Natural Gas Pipeline**

ANGDA's proposed Beluga to Fairbanks natural gas pipeline could contribute minor cumulative impacts to geology and soils in the Port MacKenzie Rail Extension project area through excavation and fill activities associated with burial of the pipeline and construction of access roads. In addition, land clearing for the project could expose highly erodible soils, which could be cumulative to potential impacts from the Port MacKenzie Rail Extension.

## **Port MacKenzie Development Projects**

Excavation and fill associated with Port MacKenzie development projects including the expansion of existing deep-draft and barge docking facilities, construction of a bi-modal bulk materials facility, and development of an open-pit gravel mine could be expected to contribute minor cumulative impacts to geology and soils in the Port MacKenzie Rail Extension project area. Construction for the bulk materials facility and gravel mining project is already underway.

## **Road Improvement Projects**

Development of new road corridors could contribute to minor cumulative impacts to geology and soils in the Port MacKenzie Rail Extension project area through excavation and fill associated with roadbed construction. In addition, land clearing for the projects could expose highly erodible soils, which could be cumulative to potential impacts from the Port MacKenzie Rail Extension alternatives. The severity of impacts to geology and soils would depend on the length and route of the proposed roadways and the types of soils they would cross. The road projects included in this cumulative impacts analysis would not be expected to result in conversion of any agricultural lands that the MSB considers to be of local importance.

## **West Mat-Su Access Project**

The construction of a bridge across the Little Susitna River and an associated access road could contribute minor cumulative impacts to geology and soils in the Port MacKenzie Rail Extension project area through excavation and fill activities associated with the construction of the roadbed and stream-crossing.

### **O.3.1.2 Conclusion**

Construction and operations activities associated with some of the projects described above would result in minor adverse impacts to geology and soils resources and could cumulatively contribute to minor potential impacts associated with the proposed Port MacKenzie Rail Extension. Most notably, to some extent these construction and operations activities would

result in minor impacts related to topographic modification and removal and replacement of the existing soil profile. In some cases the activities could lead to the exposure of highly erodible soils or conversion of agricultural lands. Furthermore, infrastructure related to these projects would have some degree of vulnerability to damage resulting from seismic events. Impacts from the proposed Port MacKenzie Rail Extension, when added to other relevant present and reasonably foreseeable future projects and actions, could result in minor cumulative impacts to soils and geology in the Matanuska-Susitna area.

## O.3.2 Water Resources

### O.3.2.1 Analysis

Table O-1 summarizes the direct and indirect potential impacts to water resources that could result from proposed Port MacKenzie Rail Extension construction and operations activities.

Table O-1 Potential Impacts to Water Resources from the Proposed Port MacKenzie Rail Extension		
Effects of Construction and Operations	Direct Impacts	Indirect Impacts
Blockage, convergence or changes to the natural drainage	x	
Altered flood hydraulics		x
Increased potential for overbank flooding and/or ice/debris jams		x
Reduced floodplain area	x	
Increased scour, bank erosion and/or channel aggradation		x
Stresses on natural water balances		x
Increased turbidity and sediment loads		x
Increased concentrations of pollutants		x
Removal of surface soils and changes in recharge potential	x	
Dewatering of aquifers		x
Impacts to wetland mitigation bank lands	x	
Impacts to Goose Creek Fen	x	

Potential rail line impacts could contribute to existing direct and indirect impacts to water resources in the project area, which have resulted from past and ongoing urban, recreation, transportation, agriculture, and natural resource development activities. The Big Lake Segment would affect the Goose Creek Fen and wetland mitigation bank lands, both of which are considered to be sensitive and important wetlands resources. The following paragraphs describe cumulative impacts to water resources from the Port MacKenzie Rail Extension when added to the impacts of several ongoing and reasonably foreseeable future projects and actions. SEA analyzed impacts to surface waters and wetlands; impacts to groundwater and floodplains were not analyzed as there are not likely to be adverse impacts to groundwater or floodplains resulting from the proposed rail line extension.

## **Cook Inlet Areawide Oil and Gas Lease Sale**

Potential impacts to surface water and wetlands from the proposed Port MacKenzie Rail Extension, when added to surface water and wetlands impacts from Cook Inlet Areawide oil and gas lease sale activities, could result in cumulative impacts to water resources in areas where the projects overlap. Development activities would include clearing corridors for seismic surveys, drilling of wells, production activities, and direct excavation and fill activities for construction of associated facilities and access roads. Physical disturbances such as land clearing, excavation, and placement of fill near waterbodies could result in direct impacts to surface water and wetlands.

## **Knik Arm Crossing**

The Knik Arm Crossing project would be expected to impact water resources in the Port MacKenzie Rail Extension project area. Bridge construction, road upgrades, new roadways to connect to the bridge, and increased traffic near waterbodies, could directly impact surface water. However, since there is no overlap of potential surface water impacts from the Knik Arm Crossing with those from the rail line extension, no cumulative impacts would result.

## **Knik-Willow Transmission Line Upgrade**

The preferred alternative for the Teeland-Douglas transmission line project could contribute to cumulative impacts to surface water and wetlands in the Port MacKenzie Rail Extension area through construction and land clearing activities near waterbodies. The preferred alternative for the transmission line would require construction that would run parallel to existing main lines and cross the proposed Port MacKenzie Rail Extension Houston North, Houston South, and Big Lake segments. The transmission line construction and clearing activities near waterbodies could directly impact the same surface water and wetlands resources as those in the impact areas of the proposed rail line segments.

## **Goose Creek Correctional Center**

The Goose Creek Correctional Center could impact surface water resources in the area of the Mac East Segment. Potential impacts to surface water resources from the Port MacKenzie Rail Extension along the Mac East Segment, when added to surface water impacts from the Goose Creek Correctional Center, could result in locally substantial cumulative impacts to surface water resources.

## **MSB Regional Aviation System Plan**

Physical disturbances such as land clearing, excavation, and placement of fill near waterbodies under the Regional Aviation System Plan could directly impact surface water resources. In addition, oil and fuel leaks from float planes and runoff from new airports and associated parking lots could reduce water quality. The potential impacts to water resources from the Big Lake Segment of the proposed Port MacKenzie Rail Extension, when added to regional and localized impacts to surface water quality from implementing the Regional Aviation System Plan, could cumulatively impact water resources in the area of the Big Lake Segment due to the proximity of the Big Lake Airport facility.



## **Beluga to Fairbanks Natural Gas Pipeline**

The proposed Beluga to Fairbanks natural gas pipeline would cross numerous waterbodies and floodplains, and cause increased off-road vehicle travel. The Enstar route for the pipeline would cross the Port MacKenzie Rail Extension Big Lake Segment, Connector 1 Segment, and Connector 2 Segment, and coincide with the Ayrshire Road option of the West Mat-Su Access Project, which includes a bridge across the Little Susitna River. The Chugach route for the pipeline would cross the Port MacKenzie Rail Extension Mac East Segment. Physical disturbances such as land clearing, excavation, and placement of fill near waterbodies could directly impact surface water and wetlands. Therefore, potential impacts to water quality from the Port MacKenzie Rail Extension, when added to potential impacts from the Beluga to Fairbanks natural gas pipeline (especially at areas near the pipeline), could result in cumulative impacts to surface water and wetlands in the area of the Connector 1 Segment, Connector 2 Segment, the Big Lake Segment, and the Mac East Segment.

## **Port MacKenzie Development Projects**

Cumulative impacts to surface water could occur in the area of the Mac West and Mac East segments as a result of the combination of surface water impacts from Port MacKenzie development projects including the expansion of existing deep-draft and barge docking facilities, construction of a bi-modal bulk materials facility, and development of an open-pit gravel mine, and the proposed rail line extension.

## **Port of Anchorage Marine Terminal Redevelopment Project**

The U.S. Department of Transportation, Maritime Administration, in cooperation with the Port of Anchorage concluded that the Port of Anchorage Marine Terminal Redevelopment Project would not result in significant adverse impacts to water resources. Therefore, there would be no significant cumulative impacts to water resources from the Port MacKenzie Rail Extension and the Port of Anchorage Marine Terminal Redevelopment Project.

## **Road Improvement Projects**

Development of new road corridors would directly impact surface water, groundwater, and floodplains resources. The scale of impacts would depend on the length and routes of the proposed roads and the waterbodies they would cross. Physical disturbances such as land clearing, excavation, and placement of fill near waterbodies could directly impact surface water resources. Water resources impacts from road projects in the areas of the Mac West, Willow, and Big East segments would overlap with potential impacts of the rail line extension resulting in cumulative impacts to surface water resources.

## **Su-Knik Wetland Bank – Umbrella Mitigation Bank – Big Lake South Individual Bank Plan**

The wetland bank concept would compensate for wetland impacts from developments that occur elsewhere. The Big Lake Segment would cross two wetland mitigation bank areas; thus reducing the wetland acreage available to compensate for the impacts of other projects. Therefore, potential impacts from the Port MacKenzie Rail Extension, when added to the

impacts of other development projects in the area of the Big Lake Segment, could result in cumulative impacts to water resources in the wetland bank areas.

### **West Mat-Su Access Project**

Construction of the bridge and access roads under the West Mat-Su Access Project could cause increased traffic near waterbodies and could directly impact surface water. Potential road options associated with the project could be constructed near Connector 1 Segment and the Willow Segment. Therefore, potential impacts to surface water resources from the Port MacKenzie Rail Extension, especially in areas close to the West Mat-Su Access Project, could result in cumulative impacts to surface water resources.

#### **O.3.2.2 Conclusion**

Construction and operations activities associated with the projects described above could impact surface water and wetlands resources in some of the same areas as certain rail line segments. There would be no overlap of impacts to the Goose Creek Fen from other present or reasonably foreseeable future proposed projects and actions. Therefore, potential impacts to water resources from the proposed Port MacKenzie Rail Extension, when added to other relevant projects and actions, could result in cumulative impacts to water resources in the Matanuska-Susitna area.

### **O.3.3 Biological Resources**

#### **O.3.3.1 Analysis**

The primary potential impacts to biological resources from construction and operations of the proposed Port MacKenzie Rail Extension would be habitat loss and altered suitability; fish, wildlife, and vegetation mortality; and reduced survival and reproductive success of native species. Linear projects that involve significant land clearing across long distances could interrupt natural fire ecology by leading to the creation of fire breaks along the project right-of-way. These fire breaks could lead to an increase in fuel accumulation along one side of the project right-of-way, thereby increasing the risk of more intense wildland fires. As a result of this disruption of the natural fire cycle, separated vegetation communities might experience different rates of ecological succession leading to a decrease in biodiversity in the project area.

All Port MacKenzie Rail Extension alternatives could contribute to cumulative impacts to biological resources in the rail line project area. The potential impacts could add to impacts from existing urban, recreation, transportation, agriculture, and resource development activities. The following paragraphs describe the impacts of other relevant projects and how potential impacts from the proposed rail line, when added to the impacts of other relevant projects, could result in cumulative impacts to biological resources.

#### **Cook Inlet Areawide Oil and Gas Lease Sale**

The ADNR's Minerals Management Service found that lease sales and potential subsequent exploration and development would have no measurable negative effects on the Cook Inlet area (MMS, 2003) and the ADNR issued a Final Best Interest Finding on January 20, 2009 (ADNR, 2009).

Oil and gas lease activities in the Susitna Flats and Goose Bay State Game Refuges could impact the same areas as the proposed rail line's Connector 1 Segment and the Mac West and Mac East segments; these rail segments would encroach on the Susitna Flats and Goose Bay State Game Refuges. Seismic survey lines and temporary and permanent access roads and facilities in these refuges could increase access to hunting and fishing areas in the refuges. Seismic survey lines could contribute to additional fragmentation of forested and wetland habitats throughout the Port MacKenzie Rail Extension project area. Cleared seismic-line and temporary-access corridors would likely receive heavy off-road vehicle use, especially corridors through heavily forested areas. Increases in off-road vehicle traffic would impact stream banks by increasing erosion at crossings and would impact wetlands as off-road vehicles make new trails through wetland areas. Any increases in off-road vehicle access would also contribute to the spread of invasive plant species by aiding in the distribution of seed material and creating environmental conditions such as soil compaction and exposed mineral soils that favor the growth of non-native plants. Therefore, potential impacts to biological resources from the proposed Port MacKenzie Rail Extension, when added to impacts from oil and gas lease activities, could result in cumulative impacts to biological resources in the Susitna Flats and Goose Bay State Game Refuges.

### **Cook Inlet Ferry**

Cook Inlet Ferry construction and operations would impact essential fish habitat, anadromous fish, marine mammals, and marine birds through reduced water quality resulting from increased suspended sediments from runoff; non-point source pollution from the ferry parking lot runoff, associated buildings, and roads; and noise from terminal and ferry operations (HDR, 2006a). Potential indirect impacts of the Port MacKenzie Rail Extension related to increased vessel traffic at Port MacKenzie, when added to marine pollution and disturbance from the Cook Inlet Ferry, could result in cumulative impacts to biological resources.

The indirect impacts of increased vehicle traffic on Port MacKenzie and Knik-Goose Bay Roads resulting from the Cook Inlet Ferry would result in collision mortality for moose and other animals. Potential wildlife-train collision impacts from the proposed rail line, particularly from the Mac East and Big Lake segments, when added to wildlife-vehicle collision impacts associated with the ferry, could result in cumulative impacts to wildlife. Increased vehicle traffic would also have the potential to contribute to the spread of invasive plant populations.

### **Cook Inlet OCGen™ Power Project**

Development of a pilot marine tidal power project employing mid-water OCGen™ turbine generator units, mooring lines, anchors, and power cables could impact marine benthic habitat, essential fish habitat, beluga whales, and marine and anadromous fish. The project could disturb migratory patterns that, along with the potential impacts to essential fish habitat from the Port MacKenzie Rail Extension, could reduce the reproductive success of salmonids. Additionally, temporary construction noise (boat traffic, pile driving, etc.) and potential turbidity would likely disturb beluga whales. Operations of the turbine generator units could potentially affect beluga whales through collision or obstruction. The Cook Inlet demonstration project area extends from north of Cairn Point in the Knik Arm to Fire Island Shoals. Potential impacts from the Port MacKenzie Rail Extension, when added to the impacts from installation of the pilot project,

could result in minor cumulative impacts to vessel traffic, noise, beluga whales, and marine and anadromous fish.

### **Knik Arm Crossing**

The Knik Arm Crossing could result in minor impacts to marine fish and invertebrates, beluga whales, and marine birds, essential fish habitat, and anadromous fish. The Knik Arm Crossing project could cause reduced freshwater habitat quantity and quality; reduced terrestrial habitat quality; changes in local abundance and distribution of bird and mammal species; increased mortality from vehicle collisions; barriers to movement between habitats; increased hunting pressure leading to population declines; and changes in game management plans for moose and brown bears (HDR and URS, 2006).

Vehicle collision mortality for moose and other wildlife from increased traffic along Point MacKenzie Road, Big Lake Road, Knik-Goose Bay Road, and other secondary roadways on the west side of Knik Arm would result due to increased traffic from the Knik Arm Crossing. Collision mortality from the Port MacKenzie Rail Extension, when added to collision mortality from the Knik Arm Crossing, could result in cumulative impacts to wildlife.

Road upgrades and new roadways that would be constructed to connect to the Knik Arm bridge would impact fisheries by decreasing water quality due to runoff of pollutants from road surfaces and increased turbidity caused by increased erosion from construction areas. In addition, underwater noise during bridge construction could adversely affect belugas as they are sensitive to types of pile driving that are within the range of their hearing. Increased vehicle traffic would also have the potential to contribute to the spread of invasive plant populations, and could cause indirect impacts to beluga whales causing them to avoid the area. Potential impacts from the Port MacKenzie Rail Extension, when added to impacts from the Knik Arm Crossing, could result in cumulative impacts to fisheries, beluga whales, wildlife, and the spread of invasive plant populations.

### **Knik-Willow Transmission Line Upgrade**

The preferred alternative for the 230 kilovolt Teeland-Douglas transmission line project would parallel the existing 230 kilovolt and 138 kilovolt lines. Upgrades to the existing lines would not require additional land clearing under the preferred alternative. Other alternatives would require land clearing of between 236 and 242 acres (Dryden and LaRue *et al.*, 2004) resulting in incremental impacts through habitat loss and alteration. The proposed power lines associated with the Port MacKenzie Rail Extension and the proposed Knik-Willow transmission line would result in collision mortality for migratory and resident bird species and when combined, could lead to cumulative impacts to these birds.

New transmission line corridors would also lead to impacts of increased habitat fragmentation and subsequent use by recreational off-road vehicles, especially along the transmission line alternatives through heavily forested areas. Potential impacts from the Port MacKenzie Rail Extension, when added to impacts of the proposed new transmission line, could result in cumulative impacts to biological resources, especially along the Houston North, Houston South, and Big Lake segments. The increase in off-road vehicle use would also result in habitat change

along streams where crossings would be made and through adjacent wetlands as off-road vehicles create more trails.

### **Goose Creek Correctional Center**

The Goose Creek Correctional Center requires clearing 150 acres of forested habitat, which would result in wildlife habitat loss and fragmentation. Correctional center operations would result in increased traffic along Point MacKenzie Road, Knik-Goose Bay Road, and other local secondary roads from correctional workers, visitors, and suppliers traveling to and from the center; the increased traffic would increase moose and other wildlife-vehicle collision mortality.

Potential impacts from the Port MacKenzie Rail Extension, when added to impacts from the correctional center, could result in cumulative habitat loss, forested habitat fragmentation, and wildlife-vehicle collision mortality, which could cause locally substantial impacts along rail line alternatives that include the Mac East Segment.

### **MSB Regional Aviation System Plan**

Upgraded and new facilities under the Regional Aviation System Plan would result in habitat loss and alteration; increased air traffic; increased associated recreational activities, which would consequently increase disturbance to wildlife, especially waterbirds and waterfowl. New float-plane facilities would result in reduced water quality due to oil and fuel leaks, and runoff from new airports and associated parking facilities, and the location of the proposed Seven-Mile Lake facility near a wetland mitigation bank area would conflict with the purpose of the mitigation bank to provide wildlife habitat. Proposed upgrades to the Goose Bay Airport would contribute to disturbance of shorebird migration staging habitat, and waterfowl migration and nesting habitat in the Goose Bay State Game Refuge, and the expansion of the Goose Bay Airport would also contribute to additional noise disturbance near habitats used by beluga whales in the Knik Arm. Increased aviation traffic and related activities would also have the potential to increase the spread of invasive plant species. Potential impacts along Port MacKenzie Rail Extension alternatives that include the Mac East and Big Lake segments, when added to the impacts of aviation system activities, could result in cumulative impacts to various biological resources.

### **Beluga to Fairbanks Natural Gas Pipeline**

The Beluga to Fairbanks Natural Gas Pipeline would contribute to habitat loss and alteration in the Susitna Flats State Game Refuge and, depending on the pipeline route alignment, the Goose Bay State Game Refuge. The proposed Enstar route would go through Susitna Flats State Game Refuge and Goose Bay State Game Refuge. The Chugach Electric Easement alternative would go through the Susitna Flats State Game Refuge, but not through the Goose Bay State Game Refuge. The pipeline would cross numerous drainages that contain essential fish habitat. Both proposed pipeline routes could increase off-road vehicle access to the Susitna Flats State Game Refuge. The Chugach Electric Easement alternative coincides with the Ayrshire Road option of the West Mat-Su Access Project, which includes a bridge across the Little Susitna River and runs parallel to an existing pipeline ROW. Pipeline corridors would facilitate off-road vehicle access to the Susitna Flats State Game Refuge and westward to the east bank of the Susitna River. Either pipeline alternatives would contribute to habitat loss and alteration, fragmentation of

forested and wetland habitats, and loss of riparian habitat along streams. If ANGDA selected the Chugach Electric Easement alternative for the pipeline, the MSB selected the Ayrshire Road option for the West Mat-Su Access Project, and the STB authorized a Port MacKenzie Rail Extension alternative that includes Connector 1 Segment, there could be substantial cumulative impacts to the biological environment in this area.

### **Port MacKenzie Development Projects**

Environmental reviews indicate that the Port MacKenzie development projects including the expansion of existing deep-draft and barge docking facilities, construction of a bi-modal bulk materials facility, and development of an open-pit gravel mine, would affect marine resources and essential fish habitat and could result in cumulative impacts to beluga whales and beluga whale habitats (National Marine Fisheries Service, 2008). The Port MacKenzie Rail Extension could indirectly contribute to cumulative effects on the beluga whale marine environment through possible increases in vessel traffic and noise. ARRC anticipates that if the proposed rail line were completed, approximately five vessels per year would arrive and load coal at Port MacKenzie (ARRC, 2009a). Development of the Port MacKenzie bi-modal facility would increase truck traffic to and from Port MacKenzie, resulting in increased moose and other wildlife-vehicle collision mortality along Point MacKenzie and Knik Goose Bay Roads. Potential wildlife-train collision mortality impacts from the proposed rail line, when added to collision impacts of the Port MacKenzie development projects, could result in cumulative impacts to wildlife, particularly in the areas of the Port MacKenzie Rail Extension Mac East and Big Lake segments.

### **Port of Anchorage Marine Terminal Redevelopment Project**

An assessment of the environmental effects of the Port of Anchorage Marine Terminal Redevelopment Project concluded that there would be no substantial cumulative impacts to vegetation and wildlife because of the disturbed nature of the site and minimal native habitat to support wildlife (DOT, 2005). The Port of Anchorage expansion project affects intertidal and subtidal habitats and could result in adverse, but not significant, cumulative impacts to essential fish habitat (DOT, 2005). The National Marine Fisheries Service determined that valuable habitat for fish and beluga whales in upper Cook Inlet would be affected by the Port of Anchorage expansion and that habitats would be degraded due to increased noise (National Marine Fisheries Service, 2006). The Biological Assessment included in this Draft EIS as Appendix H addressed potential indirect impacts from the proposed rail line to the endangered Cook Inlet beluga whale and concluded that the Port MacKenzie Rail Extension may affect, but is not likely to adversely affect, the beluga whales or access of beluga whales to Type 1 habitats in the Knik Arm. The proposed rail line could cause potential indirect effects on the beluga whale from increases in vessel traffic and associated noise and disturbance effects. When noise impacts from the Port of Anchorage expansion project are added to the potential indirect impacts of the proposed rail extension, cumulative impacts to the beluga whales could result.

### **Road Improvement Projects**

Development and improvement of road corridors would contribute to habitat loss and alteration. The scale of impacts would depend on the length and route of the proposed road and the type and

nature of the habitats that would be crossed. Most road improvement projects would require vegetation clearing next to the roadway or across new corridors, resulting in incremental habitat loss. Roadway improvements could benefit fish and wildlife by providing for enhanced fish passage with upgrades to existing bridges or culverts; reducing collision mortality for big game species with increasing driver visibility on widened roadways with improved lighting; providing for wildlife protection and movement by providing underpasses. However, these beneficial effects could be offset by detrimental effects such as incremental habitat loss and alteration; increased exposure to contaminated runoff from pavement; increased sedimentation to streams; fragmentation of connected wetlands from fill; increased traffic volumes and traffic velocity, leading to increased moose- and other wildlife-vehicle collisions. In general, the six road projects included in the cumulative impacts analysis would involve approximately 50 miles of existing or new roadways throughout the Port MacKenzie Rail Extension project area. Therefore, there could be cumulative impacts to biological resources in the form of habitat loss and alterations, and wildlife-vehicle mortality.

### **Su-Knik Wetland Bank – Umbrella Mitigation Bank – Big Lake South Individual Bank Plan**

Wetlands in wetland banks would generally be considered protected. The bank concept would facilitate development in wetland habitats outside the bank, for which the protected wetlands would be used to comply with compensatory mitigation requirements. Provided the protected wetlands are of superior capacity to support fish and wildlife populations, this would result in a net benefit for most wildlife species. The Port MacKenzie Rail Extension Big Lake Segment would cross two areas in the wetland mitigation bank and would remove wetlands in the bank, which would be contrary to the intended conservation purpose of the mitigation bank and result in a negative impact to the wetland mitigation bank.

### **West Mat-Su Access Project**

Construction of a bridge and access road under the West Mat-Su Access Project would result in incremental terrestrial and aquatic habitat loss and alteration. The new access road would cross Port MacKenzie Rail Extension segments and could enable both off-road and highway vehicles to access the rail line maintenance road along the Willow Segment and Connector 1 Segment. This increased access could put additional harvest pressure on the Little Susitna River and the Susitna River tributary fisheries and local wildlife resources. Increased access and off-road vehicle use could result in cumulative stream habitat loss from instream crossings and the habitat loss of adjacent wetlands.

### **O.3.3.2 Conclusion**

Construction and operations activities associated with the projects described above could contribute to adverse cumulative effects to the biological environment in the area of the Port MacKenzie Rail Extension. Most notably, these projects include actions that would affect wildlife habitat through habitat destruction and altered suitability, including increases in invasive plant populations and interruption of natural fire ecology, increased public access, noise, and potential direct and indirect wildlife mortality. The potential impacts of the proposed Port

MacKenzie Rail Extension, when added to the impacts of the noted projects, could result in cumulative impacts to the biological environment in the Matanuska-Susitna area.

### **O.3.4 Cultural and Historic Resources**

#### **O.3.4.1 Analysis**

The Mac East-Connector 3-Willow Alternative would affect the most known cultural resources and pass through areas with a high probability of having large numbers of undocumented cultural resources. The Mac West-Connector 1-Houston-Houston South Alternative would affect the fewest known cultural resources and pass through areas with a low probability (e.g., wetlands) of having large numbers of undocumented cultural resources.

Archaeological sites in the Port MacKenzie Rail Extension ROW that cannot be avoided could possibly be damaged during proposed rail line construction and could lose their eligibility for listing on the National Register. Numerous salmon streams in the area are host to archaeological sites in and adjacent to the streambeds and the proposed rail crossings of these streams, and changes in stream flow, could affect those archaeological sites.

Historic properties in the project area could be adversely affected and lose their context and integrity through visual and audible effects. The dog sledding cultural landscape could be adversely affected to varying degrees through loss of visual integrity, cultural privacy, potential loss of, or changes to access, and changes to traditional or culturally substantial use of, and connection, to the property. Officially recognized trails would be grade-separated, facilitating free passage; however, the integrity of any historic trails would still be adversely affected through the introduction of auditory and visual effects, and access across the study area by dog sledders who travel across unofficial trails would be impeded. All alternatives would cross the Iditarod National Historic Trail, thereby affecting the historic integrity of the trail and its ancillary network, and potentially affecting the eligibility of the ancillary network as NHPA trails or NHPA historic trail segments.

Noise and vibration impacts during construction and operations of the proposed rail line are not anticipated to be adverse as the estimated construction noise and general vibration levels would be below the FTA criteria for adverse impacts. An increase of two trains per day along the existing main line would increase noise less than three dBA and would not cause adverse noise impacts. Based on the anticipated average train speed of 40 miles per hour on the proposed rail line, the contour for the FTA fragile building damage criterion would be 10 feet wide and the vibration annoyance contour along the proposed rail line would be 80 feet of the track centerline. Since there would be no buildings within five feet of the rail line and no receptors within 80 feet from the track centerline, there would be no damage to buildings or vibration impacts due to vibration from rail line operations.

#### **Knik Arm Crossing**

Although there would be no immediate impacts from the proposed Knik Arm Crossing in the study area, any increase in residential development from people taking advantage of the short commute between Point MacKenzie and Anchorage via the bridge across the Knik Arm could



have an impact on existing cultural resources in the study area, particularly for those closest to the Point MacKenzie and Knik areas, and including the Iditarod National Historic Trail and a dog sledding cultural landscape.

### **Knik-Willow Transmission Line Upgrade**

Impacts to cultural resources from the 25-mile, 230-kilovolt transmission line could include direct destruction or disturbance of cultural resources in the transmission line ROW. However, since the preferred transmission line alternative parallels the existing transmission line, additional impacts to cultural resources would be expected to be minor.

### **Goose Creek Correctional Center**

Impacts to cultural resources from the Goose Creek Correctional Center would be localized to the 330 acres developed for the correctional facility. The contribution to cumulative impacts to cultural resources in the study area from the Goose Creek Correctional Center would likely be low given the small footprint of the correctional center compared to the study area.

### **MSB Regional Aviation System Plan**

Direct impacts to cultural resources from the MSB Regional Aviation System Plan would be localized to any new airport sites selected under this plan. Increase in access to the study area created by new airports could attract more residential development or recreational users, thereby increasing cumulative impacts to cultural resources in the study area.

### **Beluga to Fairbanks Natural Gas Pipeline**

Impacts to cultural resources in the study area from construction of a potential gas pipeline segment between Beluga and Palmer could include direct destruction or disturbance of cultural resources in the pipeline segment ROW which would be located in the southern half of the Port MacKenzie Rail Extension project area. Both the Enstar and Chugach route alignments would also cross a number of trails, several of which could have historical importance or be part of a dog sledding cultural landscape. The pipeline could diminish the integrity of these trails. Thus, the cultural resources impacts from the potential Beluga to Palmer segment of the natural gas pipeline, could cumulatively contribute to cultural resources impacts in the southern half of the Port MacKenzie Rail Extension project area.

### **West Mat-Su Access Project**

Direct impacts to cultural resources from a proposed bridge across the Little Susitna River would be localized to the site of bridge construction, if there are any cultural resources in the area. Indirect impacts to cultural resources near the bridge could be greater because the new access created by the bridge would open the western side of the Little Susitna River to an increased number of recreational users and could contribute to cumulative cultural resources impacts.

## **O.3.5 Subsistence**

### **O.3.5.1 Analysis**

All Port MacKenzie Rail Extension alternatives are in the state nonsubsistence area and are at a considerable distance from areas where state-regulated subsistence activities occur; therefore, impacts to subsistence uses outside the nonsubsistence area would be similar regardless of which alternative the STB authorized, if any. Impacts to wildlife associated with the rail line could vary depending on the alternatives. Impacts to subsistence resulting from the proposed rail line include:

- Adverse impacts to resource availability as a result of train-resource collisions, especially for species that migrate through the project area.
- Changes in resource availability if disruption from rail operations affects species distribution and/or survival rates.
- Adverse impacts to user access because of ARRC regulations prohibiting access across the rail line except at designated crossing points. The farther west the rail line alternative, the more subsistence users that could be affected.

The most substantial past impact to subsistence activities in the study area resulted from the creation of the Anchorage-Matsu-Kenai nonsubsistence area in 1992 under 5 Alaska Administrative Code 99.015, which removed subsistence hunting and fishing regulations and the subsistence priority from a large continuous area of the Matanuska-Susitna, Anchorage, and Kenai Peninsula areas. Subsequent appeals to the constitutionality of this regulation by local indigenous groups with a history of subsistence activities in the area, including the Kenaitze Indian Tribe, Ninilchik Traditional Council, Knik Tribal Council, and Native Village of Eklutna, were eventually overruled.

### **Cook Inlet Areawide Oil and Gas Lease Sale**

While offshore oil and gas development could affect fish and marine subsistence uses through potential oil spills, habitat degradation, contamination, and other effects, the study area lies in the Anchorage-Matsu-Kenai nonsubsistence area; therefore, impacts to subsistence uses from offshore oil and gas development would not be expected in the study area. Subsistence users residing in the study area who travel to other nearby subsistence areas to harvest fish or marine mammals (for example, at Tyonek) could, however, experience impacts. Any onshore oil and gas developments in the study area could affect subsistence users through the introduction of new roads, which could increase access to nearby subsistence areas (for example, Game Management Unit [GMU] 16B), thereby potentially increasing competition and decreasing resource availability.

### **Cook Inlet Ferry**

To the extent that marine activities affect beluga populations, the Cook Inlet Ferry could affect subsistence uses of beluga whales by Cook Inlet Dena'ina villages such as Tyonek, Eklutna, and Knik.

## **Cook Inlet OCGen™ Power Project**

No impacts to subsistence uses would be expected in the study area with the development of the Cook Inlet OCGen™ Power Project. The project lies in Cook Inlet within the Anchorage-Matsu-Kenai nonsubsistence area and would not be expected to impede subsistence users' access to areas managed under subsistence regulations. Studies on the impacts of the OCGen™ TGU on migrating subsistence resources such as marine mammals and fish are limited. Preliminary information related to other similar tidal devices indicates that these devices do not affect fish (ORPC, 2008). To the extent that these devices could affect beluga whale migration patterns and their populations due to device and mammal interactions through strikes and collision/entanglements, underwater noise and vibration, electromagnetic radiation fields, and alteration of habitats, it could affect subsistence uses of beluga whales by Cook Inlet Dena'ina villages such as Tyonek, Eklutna, and Knik.

## **Knik Arm Crossing**

The proposed Knik Arm Crossing could have the greatest indirect effect on subsistence of all foreseeable development projects. A bridge connecting the Municipality of Anchorage residents with Port MacKenzie and other lands in the Susitna Valley could increase the number of residents in these areas, which could in turn increase the number of people who might travel to GMU 16B for subsistence purposes, thereby increasing competition among existing users and reducing resource availability. To the extent that marine activities resulting from the bridge affect beluga whale populations, it could affect subsistence uses of beluga whales by Cook Inlet Dena'ina villages such as Tyonek, Eklutna, and Knik.

## **Beluga to Fairbanks Natural Gas Pipeline**

Impacts to subsistence in the study area from the proposed natural gas pipeline could include short-term effects on subsistence resources and user access during construction activities and potentially long-term adverse impacts to user access if the project proponents restrict user access along the pipeline ROW. However, user access to subsistence use areas in GMU 16B could also be improved by allowing general public access along the ROW.

### **O.3.5.2 Conclusion**

Cumulative impacts to subsistence uses would be minimal given that any planned or reasonably foreseeable projects in the area would be in the Anchorage-Matsu-Kenai nonsubsistence area. Several of these projects would have a small footprint in the nonsubsistence area and, except for small habitat disturbances in the immediate area, could likely contribute to larger cumulative impacts to subsistence. Two foreseeable projects that could add to cumulative impacts to subsistence uses outside the Anchorage-Matsu-Kenai nonsubsistence area are the proposed Knik Arm Crossing and the Beluga to Fairbanks natural gas pipeline projects. The Knik Arm Crossing could draw more residents to the study area, thereby increasing the number of people traveling to the closest subsistence-managed lands in GMU 16B. Depending on the proponent's policy regarding access along the pipeline ROW, the natural gas pipeline could restrict or improve subsistence user access to GMU 16B.

An overall increase in the number of development projects in the study area could lead to cumulative impacts to Knik and Eklutna tribal members' traditional use areas. While these traditional use areas are now in a nonsubsistence area, Eklutna and Knik tribal members might still have a traditional connection to the lands, and construction and operation of future projects could add to a sense of loss and intrusion by outsiders into their traditional harvest areas.

## **O.3.6 Climate and Air Quality**

### **O.3.6.1 Analysis**

SEA has concluded that increases in emissions from construction and operation of the proposed Port MacKenzie Rail Extension project would be minimal in the context of existing conditions. Using a conservative approach, SEA determined that construction emissions for the alternative requiring the most rail construction (Mac East-Connector 3-Willow, the longest potential route at 45 miles) would be expected to be a small fraction of the Borough's total annual emissions during the assumed construction period of 2 years. Estimated nitrogen oxides (NO<sub>x</sub>), PM<sub>10</sub><sup>2</sup>, and PM<sub>2.5</sub><sup>3</sup> construction-related emissions would be well below the *de minimis* conformity thresholds of 100 tons per year for each pollutant.

SEA used a similar conservative approach to estimate rail line operations emissions assuming an average of one round trip (two one-way trips) freight rail train per day with three locomotives, 80 rail cars, with a loaded weight of 125 tons per car and unloaded weight of 30 tons per car (ARRC, 2008b and ARRC, 2008a). SEA also assumed that freight trains would begin operating along the proposed rail line in 2012 (ARRC, 2008a, Section 3.4) or later using ultra low-sulfur diesel fuel (Effective December 1, 2010, all diesel fuel sold in Alaska is required to be ultra low sulfur diesel). The estimated operations-related emissions would be a small fraction of MSB annual off-highway vehicle emissions and the emission totals for each of the pollutants would be well below the *de minimis* conformity thresholds of 100 tons per year for each pollutant. SEA has also determined that emissions from the proposed terminal reserve at the end of the line in the Port MacKenzie District would be a fraction of the rail line operations-related emissions and well below the *de minimis* conformity thresholds of 100 tons per year for each pollutant.

Globally, sources of human-induced emissions of greenhouse gases include mainly burning of fossil fuels, with important contributions from clearing of forests, agricultural practices and other similar activities. Greenhouse gas emissions associated with the proposed project would be mostly carbon-dioxide (CO<sub>2</sub>) emissions. Construction-related emissions would be limited to the 2-year construction period and operations-related emissions would continue in subsequent years. Estimated annual average construction-related CO<sub>2</sub> emissions would be 3,073 metric tons per year and operations-related emissions would be 2,539 metric tons per year. Operations-related CO<sub>2</sub> emissions would represent a 2-percent increase in Alaska rail CO<sub>2</sub> emissions and would be less than 0.01 percent for Alaska as a whole (ADEC, 2008). Also, CO<sub>2</sub> emissions from existing highway activity would likely decrease as a result of the proposed rail line to the extent that transportation activity by truck would be shifted to rail. Similarly, CO<sub>2</sub> emissions would likely decrease if commodities from Interior Alaska were transported over the proposed rail line to Port

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<sup>2</sup> All particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

<sup>3</sup> All particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

MacKenzie rather than to the Port of Anchorage or Seward because of the shorter distance the commodities would move by rail.

Although the emissions generated from the construction and operation of the Port MacKenzie Rail Extension would be very small in comparison to annual global CO<sub>2</sub> emissions, they would contribute to global greenhouse gas emissions and when added to emissions from the reasonably foreseeable future projects and actions described in this Appendix (see Section O.2) and similar projects and actions across the globe, they could lead to a cumulatively adverse impact. The following paragraphs provide a discussion of the general impacts of climate change with a focus on Alaska and their effects on the proposed project.

The Intergovernmental Panel on Climate Change (IPCC) and the U.S. Global Change Research Program (USGCRP) have assessed the potential consequences of global climate change (IPCC, 2007 and USGCRP, 2009). The global average temperature since 1990 has risen by about 1.5 degrees Fahrenheit (°F) and it is projected to rise another 2 to 11.5°F by 2100 with the greatest increases expected to occur in the Arctic and in the middle of continents. The U.S. average temperature has risen by a comparable amount and is very likely to rise more than the global average over this century, with some variation from place to place (USGCRP, 2009). Over the past 50 years, Alaska has warmed at more than twice the rate of the rest of the U.S. average leading to more pronounced climate change impacts in this state than in the rest of the U.S. Alaska's annual average temperature has increased 3.4°F and the winters have warmed by 6.3°F (Fitzpatrick *et al.*, 2008 in USGCRP, 2009). Average annual temperatures in Alaska are predicted to rise about 3.5°F to 7°F by the middle of the century (USGCRP, 2009).

Precipitation patterns are also changing with increases and decreases observed across the globe and in some regions there have been increases in both droughts and floods (Trenberth *et al.*, 2007 in USGCRP, 2009). Precipitation is projected to increase overall but substantial shifts are expected in where and how precipitation occurs and simultaneous increases in air temperature are expected to lead to drier conditions overall (Meehl *et al.*, 2007 in USGCRP, 2009). Sea levels are rising at roughly double the rate observed over the past century as recorded by satellite data over the last 15 years (Bindoff *et al.*, 2007 in USGCRP, 2009).

In Alaska, higher temperatures are already contributing to earlier spring snowmelt, reduced sea ice, and widespread glacier retreat (IASC, 2004; Fitzpatrick *et al.*, 2008 in USGCRP, 2009). Reduced sea ice provides opportunities for increased shipping and resource extraction, however, at the same time increases coastal erosion (Jones *et al.*, 2009 in USGCRP, 2009) and flooding associated with coastal storms. Climate models project the Bering Sea to experience the largest decreases in atmospheric pressure in the Northern Hemisphere, suggesting an increase in storm activity in the region (Meehl *et al.*, 2007 in USGCRP, 2009). Reduced sea ice also alters the timing and location of plankton blooms which is expected to drive major shifts of marine species such as Pollock and other commercial fish stocks (Grebmeier *et al.*, 2006 in USGCRP, 2009). The Bering Sea Pollock fishery off Alaska's west coast is the world's largest single fishery and has undergone major declines in recent years (USGCRP, 2009).

Insect outbreaks and wildfires are increasing with warming temperatures and Southcentral Alaska experienced the largest outbreak of spruce beetles in the world in the 1990s destroying over 5 million acres of Alaska spruce forest (Ryan *et al.*, 2008 in USGCRP, 2009; Juday *et al.*,

2005 in USGCRP, 2009). The average area burned per year in wildfires in Alaska is projected to double by the middle of this century (Balshi *et al.*, 2008 in USGCRP, 2009).

### **O.3.6.2 Conclusion**

The relatively low concentrations of ambient air pollutants in the project area should remain well below National Ambient Air Quality Standards even with the addition of emissions associated with the proposed rail line operations. Although the greenhouse gas emissions generated from the proposed Port MacKenzie Rail Extension would be very small in comparison to global emissions levels, they could contribute to a cumulatively adverse impact on global climate change. Consequences of global climate change include increased global temperatures, change in precipitation patterns, and rise in sea levels. The long-term climate change-induced changes in water availability would not be expected to impact the proposed project as water extraction would occur only during the estimated 2-year construction period.

## **O.3.7 Noise and Vibration**

### **O.3.7.1 Analysis**

Primary noise sources during construction of the proposed Port MacKenzie Rail Extension would include heavy equipment that would be used during rail line construction and piledriving during bridge construction. Construction of bridges is anticipated only for the Big Lake Segment, the Willow Segment, and Connector 1 Segment.

The primary sources of noise from proposed rail line operations would be wayside noise and locomotive warning horn sounding for at-grade rail-highway crossings. Because of the relatively low ambient noise level and proximity of receptors, the 3 A-weighted decibel (dBA) increase contour associated with the Big Lake Segment would include 16 receptors, 8 receptors with the Houston South Segment, and 2 receptors with the Mac West Segment. Because of relatively low ambient noise levels in these areas, train noise would be more noticeable than in other areas with higher ambient noise levels. However, because noise levels would be below a 65 decibel day-night average noise level (DNL) for all identified potential receptors, there would be no adverse noise impacts associated with any of the rail line alternatives.

## **Cook Inlet Areawide Oil and Gas Lease Sale**

One of the primary concerns related to oil and gas development in marine waters is the potential effect that noise from seismic surveys, construction activities, and ongoing boat, drilling, and aircraft activities, could have on marine mammals and other marine animals (Hofman, 2003). In 2005, the Minerals Management Service found that a proposed geophysical (seismic) survey would have no significant effect on the lower Cook Inlet Area (MMS, 2005).

## **Cook Inlet Ferry**

A minor adverse impact during construction of the Cook Inlet Ferry would include increased noise. Upgrades to the Knik Arm Access Road could temporarily increase noise levels near the mouth of Ship Creek. Additionally, it is unlikely that noise levels would have a lasting adverse impact on fish in Knik Arm or near the mouth of Ship Creek, because these areas currently

experience considerable noise due to Port MacKenzie, U.S. Air Force, and ARRC operations. Construction activities would be temporary and would not be expected to last more than 6 months.

### **Knik Arm Crossing**

The proposed Knik Arm Crossing project could facilitate development in the MSB, which would lead to increased noise levels in the study area.

Future noise levels under the proposed Knik Arm Crossing build alternatives for each of the three receptors in the MSB portion of the study area are projected to range from 60 to 64 dBA, depending on the alternative, and are not expected to approach the noise abatement criteria for residential areas.

Traffic-noise modeling results indicate that there would be impacts from traffic noise within 200 feet of the centerline of the proposed Knik Arm Crossing ROW. Therefore, any future residential land uses immediately adjacent to the ROW could experience traffic noise impacts. More noise-compatible uses, such as commercial or retail activities, would not be affected at this distance. For areas where the ROW might be wider than 400 feet, there should be no impacts from traffic noise.

### **MSB Regional Aviation System Plan**

Implementation of the Regional Aviation System Plan would include upgrades to existing airstrips and development of new airports and float-plane facilities. The plan identifies noise-sensitive land uses, but does not include a noise impacts analysis. SEA assumes noise impacts due to increased air traffic would be moderate or less.

### **Port of Anchorage Marine Terminal Redevelopment Project**

Because construction activities such as dredging, filling, and pile driving would be the same for all construction years, noise levels during any construction day would remain around 81 dBA (equivalent sound level [ $L_{eq}$ ]) at 100 feet (within the Port of Anchorage) and 61 to 65.5 dBA at 1,000 to 2,000 feet in any given year. What varies by construction year is the duration of pile driving, which is the loudest contributor of the noise. Pile driving associated with dock construction is anticipated to range from a high of 130 days to a low of 106 days. Although some hourly noise levels would exceed 85 dBA, daily noise levels from construction at the Port of Anchorage would not exceed the 85 dBA 8-hour time-weighted level in which a hearing conservation program for on-site workers is required under the Occupational Safety and Health Administration (29 Code of Federal Regulations 1910.95).

Maximum noise levels in nearby residential areas from construction at the Port of Anchorage would not exceed the Anchorage noise ordinance requirements of 80 (hourly  $L_{eq}$ ) dBA during any of the construction years. Therefore, construction noise would not affect residential areas. Noise levels in DNL at areas closest to construction at Cherry Hill housing, parks, and residential areas on Government Hill are projected to be between 61.0 and 65.5 dBA during a construction day, increasing 0.5 to 1.0 dBA over baseline levels. This amount of change falls below the

threshold for cumulative noise levels. Therefore, construction noise would not have a significant adverse impact on adjacent residential areas.

### **South Wasilla Rail Line Relocation**

A noise and vibration analysis indicated that no significant noise and vibration impacts are expected. Existing noise sources in the project vicinity include roadway traffic, aircraft overflights, railroad operations, and local neighborhood activities. The project would reduce horn noise because trains would no longer have to sound their horns at the five eliminated at-grade mainline crossings. Trucks using the gravel pits and freight and passenger trains operating through the area are the primary sources of existing vibration. The vibration analysis indicated that one property would be affected; however, this property is already affected by the existing track. The noise and vibration analysis indicated that the project's impact to this property would be small enough that the vibration change would not be perceptible to the residents.

#### **O.3.7.2 Conclusion**

Construction and operations activities associated with the projects described above could contribute minor noise-related impacts to the environment in the study area. Although some of these projects include actions that would increase noise levels considerably, there is no overlap of the areas of noise impact from these projects and actions with the areas of potential noise impact from the proposed rail line. Because no adverse noise impacts would result from the proposed rail line extension, no cumulative noise impacts would result.

### **O.3.8 Energy**

#### **O.3.8.1 Analysis**

All segments of the Port MacKenzie Rail Extension would cross a 230-kilovolt transmission line linking the Beluga Power Plant near Tyonek to a bulk substation just south of the Port MacKenzie District. The Big Lake, Houston South, and Houston North segments would also cross a 138-kilovolt transmission line parallel to the ARRC main rail line between Knik-Fairview and Willow. Connector 1 Segment, Connector 3 Segment, and the Big Lake Segment would cross the Beluga-Wasilla natural gas pipeline that runs along Ayrshire Avenue and just north of Point MacKenzie Road. ARRC would have to ensure appropriate grade separations and employ appropriate construction industry standards to minimize any potential to disrupt the provision of energy resources. Increases in energy consumption for proposed rail line construction would be negligible. Train operations would consume less than 0.5 percent of the annual statewide consumption of distillate fuel.

### **Cook Inlet OCGen™ Power Project**

Increased production of energy from the utilization of the Cook Inlet tidal flows would establish landfalls for transmission line routes along Cook Inlet's eastern coast near Kenai and East Foreland. In areas of potential overlap with Port MacKenzie Rail Extension segments, Ocean Renewable Power Company would need to carefully site their transmission line pylons to avoid the risk of power interruptions.



## **Knik-Willow Transmission Line Upgrade**

This project is in the preliminary stage of design, and there could be changes to the current alignment. ARRC would need to coordinate with the Alaska Energy Authority regarding possible relocation of pylons.

## **Beluga to Fairbanks Natural Gas Pipeline**

ANGDA has started the process for preparing an EIS for a natural gas pipeline between Beluga and Fairbanks that would cross the Port MacKenzie Rail Extension project area. The proposed new pipeline would parallel the existing Beluga-Wasilla natural gas pipeline. The Enstar route alignment of the Beluga to Fairbanks pipeline would cross proposed Connector 1 Segment, Connector 3 Segment, and the Big Lake Segment. The Chugach route alignment of the Beluga to Fairbanks pipeline would cross the Mac East and Mac West segments. ARRC would need to coordinate with ANGDA to ensure that grade separation and appropriate construction industry standards are followed.

### **O.3.8.2 Conclusion**

Cumulative impacts on energy resources in the affected area would be limited to crossings of the Port MacKenzie Rail Extension alternatives with proposed transmission lines and pipelines. Coordination between ARRC and agencies responsible for the proposed project would be required to ensure appropriate planning for location of transmission pylons and for grade separation between the Port MacKenzie Rail Extension and proposed pipelines.

## **O.3.9 Transportation Safety and Delay**

### **O.3.9.1 Analysis**

The proposed project has the potential to result in impacts to traffic safety and delay on the network of local, arterial, and collector roads that comprise much of the existing transportation system in the project area. Where new crossings on the proposed Port MacKenzie Rail Extension would be grade separated, there would be no increase in the number of potential train-vehicle accidents and no change in vehicle delay. Where crossings would not be grade separated (at-grade crossings), SEA's analysis indicates that there could be some accidents and an increase in vehicle delay.

At present, there are four at-grade crossings along the ARRC main line in the project area. SEA's analysis indicates that accident frequencies at the existing at-grade crossings would increase slightly due to increased train traffic from the proposed rail line. For these at-grade crossings, the greatest accident frequency increase would be 6.2 percent. This corresponds to a decrease in the time between predicted accident events from one accident every 66 years under existing conditions to one accident every 62 years under the proposed project. For new at-grade crossings constructed as part of the proposed project, the predicted accident frequency for the most heavily traveled roads, South Burma Road and Willow Creek Parkway, would be one accident every 131 and 114 years, respectively.

SEA anticipates temporary vehicle delays during proposed rail line construction at new at-grade crossings and where roads would be improved or relocated. At the existing at-grade crossing with the highest total daily delay, Willow Fishhook Road on the ARRC mainline, the number of vehicles delayed is projected to increase from 11 to 13 delayed vehicles per day under the proposed rail line. This represents an increase from 0.5 to 0.7 percent of all vehicles traveling through that crossing. At the new at-grade crossings constructed as part of the proposed rail line, the highest total delay would be 0.3 percent of all daily traffic at the South Burma Road crossing. Although Port MacKenzie Rail Extension project operations would impact delay at at-grade crossings, SEA concludes that this impact would be minimal.

Impacts to transportation safety resulting from at-grade crossings are largely a function of the number of trains and the volume of vehicle traffic traversing the at-grade crossing, along with other factors. Impacts to transportation delay are influenced primarily by the amount of time trains obstruct an at-grade crossing, and the volume of vehicle traffic along roads with at-grade crossings. Therefore, the other projects and actions with the greatest potential to cumulatively contribute to impacts on transportation safety and delay are those that increase train traffic along the Port MacKenzie Rail Extension or ARRC main line in the project area; those that increase vehicle volume on roads that have at-grade crossings of the Port MacKenzie Rail Extension or the ARRC main line in the project area; or those that result in the construction of additional at-grade crossings in the project area.

### **Projects with the Potential to Affect Rail Traffic**

Of the potential projects identified in Section O.1, the Port MacKenzie development projects, including gravel mining, the bulk materials facility, and the deep-draft and barge dock expansions, could increase rail traffic along the Port MacKenzie Rail Extension. However, the need for increased shipments of bulk materials, intermodal containers, and other freight to and from Port MacKenzie is part of the purpose and need of the ARRC proposed action and was factored into the analysis of direct and indirect impacts. If the Port MacKenzie development projects increased rail traffic beyond the levels already evaluated in the impacts analysis, there would be increased rail traffic along the Port MacKenzie Rail Extension (regardless of alternative), which would lead to more traffic delays and increased accident frequencies at at-grade crossings in the area. The other projects identified in this cumulative impacts analysis are not anticipated to increase rail traffic in the project area.

### **Projects with the Potential to Affect Vehicular Traffic**

Projects that would increase the amount of vehicular traffic in the Port MacKenzie Rail Extension project area could be expected to increase the frequency of future accidents and add to the number of vehicles delayed by train traffic. These impacts would depend on the combination of segments constructed as part of the proposed Port MacKenzie Rail Extension and the roads where traffic volumes would increase. In most cases, increased delay and accident frequencies would occur only if traffic volumes increased along roads that cross the proposed rail line at grade. However, if traffic increased along nearby roads or other primary roads in the project area, there could be increased traffic spill-over onto the roads with at-grade crossings.

## **Knik Arm Crossing and Cook Inlet Ferry**

Of the projects listed in Section O.1, both, the proposed Knik Arm Crossing and the Cook Inlet Ferry were identified as projects that could increase vehicular traffic from Anchorage to Port MacKenzie, leading to higher traffic volumes in the area of the proposed rail line. The Knik Arm Crossing would connect the Municipality of Anchorage to the MSB via Point MacKenzie Road, which the proposed rail line's Big Lake Segment would cross at grade. If this segment and the Knik Arm Crossing were constructed, there could be increased vehicular traffic along a road with an at-grade crossing, thereby increasing the frequency of future accidents and the number of vehicles delayed by train traffic. Cook Inlet Ferry operations could also lead to increased traffic on Point MacKenzie Road, and could also lead to increased transportation safety and delay impacts at the at-grade crossing.

## **West Mat-Su Access Project**

The West Mat-Su Access Project would include road access to the Fish Creek Management Area that could cross Port MacKenzie Rail Extension Connector 1 Segment and/or the Willow Segment. One access road option associated with this project would cross both the Connector 1 and Willow segments, while the other access road options would only cross either the Willow Segment or Connector 1 Segment. If at-grade crossings were constructed at intersections of the roads in the West Mat-Su Access Project and the rail line, they would increase the frequency of future accident events and the number of vehicles that could experience delay at at-grade crossings.

## **Other Road Projects**

Section O.1 identifies several other road projects. These actions can be generally characterized as upgrades to road surfaces, increases in the number of lanes to road segments, addition of safety devices, and flattening and straightening roadways. Evaluated individually, these projects would not be expected to notably affect the overall volume of traffic in the area of the proposed rail line. They would not include new at-grade crossings and they would not increase traffic on the roads the Port MacKenzie Rail Extension would cross using at-grade crossings. Therefore, none of the road projects would contribute to a cumulative impact on transportation safety and delay. However, the combination of all road projects would lead to an overall upgrade in the transportation infrastructure in the project area. As road infrastructure improved and capacity was added, this could encourage more vehicular traffic in the project area for a variety of reasons, including access to recreational resources; driving through the area en route to other destinations; and/or increased commercial, industrial, and residential development allowed by improved roadways. As the general volume of traffic in the project area increased, the likelihood of a portion of that traffic spilling over onto roads with at-grade crossings would increase. Therefore, road projects that improve the transportation infrastructure in the Port MacKenzie Rail Extension project area could lead to cumulative impacts on transportation safety and delay.

### **O.3.9.2 Conclusion**

The proposed Port MacKenzie Rail Extension is expected to result in a small increase in future accident frequencies as a result of at-grade crossings. The proposed rail line is not anticipated to

result in a considerable increase in vehicle delay. There could be an increase in future accident frequency and vehicle delay as a cumulative result of the proposed rail line combined with Port MacKenzie development projects, the Knik Arm Crossing, Cook Inlet Ferry, the West Mat-Su Access Project, and road improvement projects.

### **O.3.10 Navigation**

#### **O.3.10.1 Analysis**

The proposed Port MacKenzie Rail Extension includes bridges and structures that would cross inland rivers and streams in the project area, resulting in negligible potential impacts to navigation. The Willow, Houston North, and Houston South segments include a bridge crossing of the Little Susitna River. Of the reasonably foreseeable future projects analyzed for cumulative impacts, only the proposed West Mat-Su Access Project would include a new bridge across the Little Susitna River, creating the potential for cumulative impacts to navigation along this waterbody.

For the West Mat-Su Access Project, the MSB proposes to build a bridge across the Little Susitna River into the southern part of the Fish Creek Management Area, thereby providing road access to the western side of the Little Susitna River. The Fish Creek Management Area is approximately 45,000 acres of State of Alaska and MSB land northwest of Point MacKenzie between the Little Susitna and Big Susitna Rivers. The Draft Fish Creek Management Plan (MSB, 2008a) includes a figure depicting three potential locations for the bridge – the extension of Susitna Parkway in the Big Lake area; a location approximately 0.8 mile north of where the Iditarod National Historic Trail crosses the river; and a location near the existing Little Susitna River access at the end of Ayrshire Road. The Access Project might also include a short spur road continuing 3 to 4 miles west, past the Little Susitna River. The MSB has not yet developed a detailed bridge design.

#### **O.3.10.2 Conclusion**

Assuming that the bridge across the Little Susitna River would be designed with vertical and horizontal clearances similar to other existing and proposed bridges on the river, significant impacts to navigation would not be likely, and there would not be substantial cumulative impacts.

### **O.3.11 Land Use**

#### **O.3.11.1 Analysis**

The MSB, the State of Alaska, and private entities own most of the land the proposed rail line would directly affect. Potential impacts to land use from proposed Port MacKenzie Rail Extension construction and operations would vary depending on alternative. Existing land uses within the ROW would be permanently changed, and any activities within the ROW not associated with the rail line would require an ARRC entry permit. In the area of the Big Lake Segment the proposed rail line extension would require the taking of approximately ten structures, most of which are residences. The proposed rail line would also require the taking of

two structures in the ROW of the Connector 3 Segment, and one structure in the Mac East Segment ROW. There would be no adverse land use impacts outside the ROW.

Public lands in the project area are used primarily for recreation, hunting, and fishing. Construction activities could temporarily impede access to trails and waterways, including the Iditarod National Historic Trail. Operations activities could impact the experience of users engaged in activities such as recreation, hunting, fishing and wildlife viewing. Officially recognized trails would be grade-separated or relocated, but ARRC has not proposed to provide crossings for unofficial trails. Unofficial trails would be blocked, and ARRC's trespassing regulations would prohibit the public from crossing of the ROW without first obtaining approval from ARRC.

Mining and timber harvesting are also allowed by permit. Private lands in the project area are primarily in agricultural and residential use. Lands outside the ROW would maintain their existing ownership and uses, but landowners could change the way they use the land as allowed by MSB building or zoning rules. The proposed rail line includes two freight-only trains per day, with no passenger service or whistle stops. Except for the rail line and associated facilities within the ROW, the presence and operation of the proposed rail line would not likely result in substantial changes in land use in the project area.

### **Cook Inlet Areawide Oil and Gas Lease Sale**

The proposed lease sale area consists of all state-owned uplands in the Matanuska and Susitna River valleys generally south and west of Houston and Wasilla; the Anchorage Bowl; the western and southern Kenai Peninsula from Point Possession to Anchor Point; and the western shore of Cook Inlet from the Beluga River to Harriet Point. The lease sale area also includes all state-owned tidal and submerged lands in upper Cook Inlet from Knik Arm and Turnagain Arm south to Anchor Point and Tuxedni Bay (ADNR, 2008).

The lands offered in this lease sale include lands in which the state owns both the land and mineral estate and lands where the state owns just the mineral estate, with the land estate either privately owned or held by a borough or municipality. Only state-owned lands and oil and gas mineral estates within the tracts that are free and unencumbered would be included in any lease issued. The use of some lands leased could change from undeveloped to developed for oil and gas production if exploration finds developable reserves. This change in land use for leased areas, combined with land use impacts from the proposed Port MacKenzie Rail Extension, could result in cumulative impacts to existing land use patterns in the project area. Depending on where future land-based lease sales occur, cumulative impacts to recreational resources could result.

### **Knik Arm Crossing**

Of all foreseeable development projects, the proposed Knik Arm Crossing could have the greatest impact on land use. The area from Point MacKenzie/Port MacKenzie to approximately Parks Highway, which includes the Big Lake and the Knik-Fairview areas, would likely experience increased growth and development with the proposed bridge in place (HDR, 2006b). The proposed Point MacKenzie Road and Northern Access alternatives associated with the Knik

Arm Crossing project would be consistent with the MSB Long Range Transportation Plan, MSB Core Area Comprehensive Plan, and MSB Special Use Districts because a Knik Arm crossing is identified and described in those plans as part of the future transportation system. At present, there is no zoning, no building-permit requirement, and few MSB land use controls in the southwest MSB area (HDR, 2006b). Increased access, provided by the Knik Arm Crossing, could contribute to significant cumulative impacts to land use patterns within the project area. However, since the proposed rail line has minimal land use impacts, its contribution to cumulative land use impacts is minimal.

The indirect impacts of increased traffic, and growth and development could affect some of the same recreational resources as those potentially affected by the Port MacKenzie Rail Extension, thereby resulting in cumulative impacts.

### **Knik Willow Transmission Line**

The proposed transmission line could potentially conflict with land use in the area of the Little Susitna State Recreation River, which would combine with potential impacts to recreational resources in the areas of the Houston North, Houston South, and Big Lake segments and could result in cumulative land use impacts.

### **Goose Creek Correctional Center**

The Goose Creek Correctional Center requires clearing 150 acres of forested land at the junction of Alsop Road and Point MacKenzie Road. The MSB owns this undeveloped land. Impacts to land use from this project would be near to, but not overlapping, potential impacts from the Port MacKenzie Rail Extension's Mac East Segment. Therefore, cumulative impacts to land use patterns and recreational resources in the project area would be minimal.

### **MSB Regional Aviation System Plan**

Upgrades to existing airstrips and development of new airports and float-plane facilities would take place by implementation of the Regional Aviation System Plan. Upgraded and new facilities could increase access and demand for land in the project area. The plan requires that an airport, commercial floatplane base, helipad, and heliport be shown on a plat if subdivision of land is required. This requirement would help ensure that adequate land is provided for approach and departure clearances and development setbacks from runways, and that the aviation facility's compatibility with surrounding land uses is considered before a plat is approved. Therefore, cumulative impacts to land use and recreational resources would be expected to be minimal.

### **Beluga to Fairbanks Natural Gas Pipeline**

ANGDA's proposed Beluga to Fairbanks natural gas pipeline could contribute to changes in land use in the Port MacKenzie Rail Extension project area. The proposed pipeline corridor would transverse the southern and eastern reaches of the project area, bisect the Mac West Segment near its southern terminus, and parallel the Mac West Segment where it would run along West Point MacKenzie Road. The pipeline's Chugach route alignment would bisect the Big Lake Segment, Connector 1 and Connector 3 segments, crossing privately-owned, Native Corporation and State of Alaska land. These areas could experience cumulative impacts to land use and

recreational resources in areas of Port MacKenzie Rail Extension segments that overlap with the proposed pipeline alignment and the pipeline's Alternative 1.

### **Port MacKenzie Development Projects**

Port MacKenzie development projects include the expansion of existing deep-draft and barge docking facilities, construction of a bi-modal bulk materials facility, and development of an open-pit gravel mine. Some of these projects have already been constructed. The gravel mine is operating in the vicinity of the southern terminus of the Mac East and Mac West segments. The land in the vicinity of the port is either undeveloped public or privately owned land. There is some past and present agricultural use. Development of industrial-related facilities to support the Port of MacKenzie would constitute a permanent change from undeveloped or agricultural land to developed industrial land. Where these areas coincide with the proposed rail line, there could be cumulative impacts to land use. There are no impacts to recreational resources from the proposed rail line extension that overlap with impacts of the port development projects, therefore, no cumulative impacts would be expected to occur.

### **South Wasilla Rail Line Relocation**

The proposed track realignment and other action alternatives could have a minor cumulative impact on land use by removing some parcels that are currently residential and other parcels that could be used for future expansion of the existing residential community (Creekside Preserve residential area). There are no foreseeable large-scale economic activities that would stimulate a substantial amount of expansion of the community; therefore, adequate vacant replacement land is available, and potential adverse cumulative impacts to land use would be minimal. There are no impacts from the proposed rail line to recreational resources in the area of the South Wasilla Rail Line Relocation, therefore, no cumulative impacts to recreational resources would be expected to occur.

### **West Mat-Su Access Project**

The proposed West Mat-Su Access Project includes development of access across the Little Susitna River into the southern Fish Creek Management Area. Construction of a bridge and access road would result in incremental changes to land use in the vicinity of the proposed Port MacKenzie Rail Extension. At present, this land is undeveloped private- and publicly-owned land. The West Mat-Su Access Project's new access road would cross either Connector 1 Segment and/or the Willow Segment. The bridge access road could also facilitate access to these areas for hunting, fishing, and recreation. Potential impacts to recreational resources from the proposed rail alignment, when combined with impacts from the West Mat-Su access project could result in cumulative impacts to recreational resources.

### **O.3.11.2 Conclusion**

The proposed Port MacKenzie Rail Extension would not likely result in substantial changes in land use patterns in the project area, with the exception of the rail line associated facilities within the ROW. Impacts of the proposed rail line could combine with the impacts of the Cook Inlet areawide oil and gas lease sale and the Knik Arm Crossing to produce potentially substantial changes in land-use patterns; the rail line contribution to those cumulative impacts would be

expected to be minimal. The Beluga to Fairbanks natural gas pipeline project could combine with the Port MacKenzie Rail Extension to produce cumulative impacts to land use in the areas of the Connector 1, Connector 3 and Mac West segments, depending on pipeline and rail line route alternatives.

As noted on Figures 13.2-1 through 13.2-6 and Table O-2, all segments of the proposed Port MacKenzie Rail Line Extension could result in impacts to recreational resources. Potential impacts to recreational resources could overlap with impacts from certain other projects resulting in cumulative impacts. All rail line alternatives would cross the Iditarod National Historic Trail.

**Table O-2**  
**Impacts to Recreation Areas and Trails by Alternative <sup>a</sup>**

Alternative	Willow Creek State Recreation Area	Nancy Lake State Recreation Area	Little Susitna State Recreation River	Susitna Flats State Game Refuge	Point MacKenzie Trailhead and Parking Lot	West Gateway Trails	Iron Dog Trail	Crooked Lake Trail	Iditarod National Historic Trail	Houston Lake Loop Trail	Flat Lake Connector Trail	Aurora Dog Mushing Trails	Mud Lake Trail	Iditarod Link Trail	Flathorn Lake Trail	Pipeline Trail	Figure 8 Lake Loop Trail	Lucky Shot Trail	Nancy Lake – Susitna Trail	Herning Trail	16 Mile Trail	Knik Connector Trail
Mac West-Connector 1-Willow	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X			
Mac West-Connector 1-Houston-Houston North			X	X	X			X	X	X	X			X	X	X	X					
Mac West-Connector 1-Houston-Houston South			X	X	X			X	X	X	X			X	X	X	X					
Mac West-Connector 2-Big Lake				X	X				X			X					X			X	X	X
Mac East-Connector 3-Willow	X	X	X	X		X	X	X	X				X	X				X	X			
Mac East-Connector 3-Houston-Houston North			X					X	X	X	X											
Mac East-Connector 3-Houston-Houston South			X					X	X	X	X											
Mac East-Big Lake									X			X								X	X	X

<sup>a</sup> Source: ADNR, 2009

## O.3.12 Socioeconomics

### O.3.12.1 Analysis

The potential socioeconomics impacts of the Port MacKenzie Rail Extension would include a temporary increase in direct employment during construction. This temporary increase in direct employment would be complemented by additional indirect employment generated through suppliers and service providers, and induced employment through multiple rounds of expenditures and consumption along production and consumption chains. The increased labor demand is expected to be met in part by the local labor force, and any increased pressures on



housing and public services derived from the migration of laborers to the affected area would be minor.

Potential long-term negative impacts that the Port MacKenzie Rail Extension could have on recreational activities, by crossing land used for recreational purposes, are expected to be minor and minimized through appropriate crossings for people and wildlife at trail crossings and within state recreational areas. ARRC would provide grade-separated crossings or relocations for officially recognized trails, but has not proposed to provide crossings for unofficial trails. Unofficial trails would be blocked, and ARRC's trespassing regulations would prohibit crossing of the ROW.

The cumulative impacts analysis required expanding the analysis of housing availability to include the Municipality of Anchorage, because some of the projects expected in the near future would be either in Anchorage or link the MSB to Anchorage. The Municipality of Anchorage would be a potential option for residence for workers on these projects.

Table O-3 lists reasonably foreseeable projects that could generate cumulative socioeconomic impacts to those generated by the Port MacKenzie Rail Extension, and identifies what those cumulative impacts could be. The table does not include the Su-Knik Environmental Mitigation Bank. The bank would be used to offset authorized impacts to wetlands with no reasonably foreseeable impacts on employment, migration, demand for housing and public services, or economic activity. The table includes the Cook Inlet areawide oil and gas lease sale because it would have socioeconomic impacts through its subsequent activities (exploration and production of oil and gas). Potential socioeconomic impacts would include job creation; potential in-migration of workers to production areas, generating increased demand for housing and public services; and potential use of land currently used for recreational activities. However, the extent of these potential impacts on the MSB would depend on the specific areas for which bids are received and the extent to which exploration leads to production. Because this is currently unknown, no further cumulative impacts analysis is included here. The table includes the MSB Regional Aviation System Plan to the extent that implementation includes upgrades of public airports in the area or the construction of a new public airport. Because discussions of potential locations for a new airport are still preliminary, permanent increases in local demand for labor, housing, and public services, or displacements and loss of economically productive land generated by the construction of a new airport, cannot be determined at this time.

All projects listed in Table O-3 would temporarily generate increased demand for construction labor in the project area, as and if they came to fruition. Although estimates of the number of jobs generated by each of these projects are not readily available, there are estimates for some of the potentially larger projects. Construction of the proposed Knik Arm Crossing would generate an annual average of between 2,200 and 3,100 jobs in its 2-year construction period, with a share of these jobs being filled by non-local hires. A construction start date for the bridge is not yet known. The Goose Creek Correctional Center is located at a site 9 miles from the Port MacKenzie dock; construction began in spring 2009 and is expected to be complete by late 2011 to early 2012 (MSB, 2008b). This construction project is expected to generate 600 to 700 jobs. To the extent that these large construction projects absorb the existing local labor force, the Port MacKenzie Rail Extension would be obliged to recruit from beyond the MSB for construction

**Table O-3**  
**Potential Impacts of Expected Projects in the Affected Area**

	<b>Temporary Increase in Demand for Labor (construction)</b>	<b>Permanent Increase in Local Demand for Labor, Housing, and Public Services</b>	<b>Displacements, Loss of Economically Productive Land, or Barriers to Mobility</b>
Cook Inlet OCGen™ Power Project	✓		
Knik-Willow transmission line upgrade	✓		
B2F natural gas pipeline	✓		✓
Cook Inlet Ferry	✓	✓	
Knik Arm Crossing	✓	✓	
Goose Creek Correctional Center	✓	✓	✓
Port MacKenzie development projects	✓	✓	
South Wasilla rail line relocation	✓		✓
Redevelopment of the Port of Anchorage Marine Terminal	✓		
West Mat-Su access road to the Fish Creek area	✓		✓
Various road improvement projects	✓	✓	
Cook Inlet areawide oil and gas lease sale	✓		
MSB Regional Aviation System Plan	✓	✓	✓

workers. In that case, increased pressures on housing and public services from labor migrating to the MSB to work on the Port MacKenzie Rail Extension would add to the pressure generated by other construction projects.

Some of the construction projects would employ workers who reside in the Anchorage urban area and would not necessarily stimulate relocation to the MSB. This would be the case for the redevelopment of the Port of Anchorage Marine Terminal, and likely the Knik Arm Crossing and the Cook Inlet Ferry. To the extent that the labor employed is able to reside in Anchorage, not only the Anchorage labor force but also its housing market, would be available to address the rising demands (for labor and housing for in-migrating labor) from the projects. The Municipality of Anchorage is estimated to have 110,164 housing units, 7,688 (7 percent) of which were estimated to be vacant between 2005 and 2007 (U.S. Census Bureau, 2005-2007).

Some projects could permanently increase the demand for housing and public services in the MSB. The Goose Creek Correctional Center operations area is expected to create 350 prison jobs (MSB, 2008c). The proposed Knik Arm Crossing, the Cook Inlet Ferry, and the improvement of roads around Port MacKenzie would reduce the travel time between Anchorage and areas in the MSB such as Knik-Fairview and Big Lake. This could stimulate the use of these

MSB areas for residential or business purposes linked to Anchorage. To the extent that increased migration to the MSB derives from this shorter commute to Anchorage, this could contribute to a cumulative increased demand on local housing and associated public services such as water, sanitation, and electricity. Because this permanent stimulus for relocation would occur only after construction was completed, the MSB housing market and its public services would have time to adjust to expected increases in demand.

Some projects would occupy or cross lands potentially used for various economic activities. The proposed Beluga to Fairbanks natural gas pipeline would cross the Port MacKenzie Rail Extension project area parallel to the existing Beluga-Wasilla natural pipeline; the Goose Creek Correctional Center would be developed at the corner of Alsop Road and Point MacKenzie Road; and the South Wasilla rail line relocation would straighten about 4 miles of the rail line in the Wasilla urban area. The cumulative impacts of the Port MacKenzie Rail Extension and these projects on the economic activities derived from the use of lands in the affected area is expected to be minor. Burial of the Beluga to Fairbanks natural gas pipeline would minimize impacts to the productive use of lands crossed; the Goose Creek Correctional Center would be developed off recreational parks or trails in a mostly undeveloped area; and the South Wasilla rail line relocation would cross mostly vacant, residential, and some commercial (gravel pit) land. A fourth project, the proposed West Mat-Su Access road to the Fish Creek area would cross the Little Susitna State Recreation River and possibly the Susitna Flats State Game Refuge, providing access from the eastern side of the Little Susitna River. To the extent there were any impacts to recreational activities, these could be cumulative to those from the Port MacKenzie Rail Extension, particularly along the Willow Segment, which would also cross the Little Susitna State Recreation River in the same general area.

### **O.3.12.2 Conclusion**

Cumulative impacts to socioeconomic resources would include increased demand for labor that would likely lead to increased demand for local housing and public services to the extent that labor migrates to the MSB from outside the area. Labor for some of the construction projects could come from the Municipality of Anchorage and reside in that area, which would reduce pressure on the MSB housing market and public services from migration to the area. To the extent that some of the projects would shorten the commute time between the MSB and Anchorage, there could be incentives for permanent relocation of workers to the MSB. However, because this permanent stimulus for relocation would occur only after construction was completed, the MSB housing market and its public services would have time to adjust to increases in demand. Cumulative impacts to recreation activities from use of land by the various expected projects in the affected area would be expected to be minor.

### **O.3.13 Environmental Justice**

Because proposed Port MacKenzie Rail Extension construction and operations would not result in high and adverse impacts to human health or the environment, there would be no disproportionately high and adverse impacts to minority and low-income populations.

Based on the cumulative impacts analysis in this appendix and summarized in Chapter 16 of this Draft EIS, there would be no high and adverse impacts to human health or the environment from

the cumulative impacts of proposed Port MacKenzie Rail Extension construction and operations activities when added to the impacts of other past, present and reasonably foreseeable future projects and actions.

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